

APPENDIX B

Ecological Risk Assessment Worksheet - Imazapic

DERIVATION OF EECS

Section 3.0 of the Methods Document (ENSR 2005) presents the details of the exposure scenarios considered in the risk assessments. The following sub-sections describe the scenarios that were evaluated for bromacil. Note that in many cases, units were converted during the calculations (e.g., lb/acre converted to mg/cm²). These conversions were not included in the equations presented below.

Direct Spray

Plant and wildlife species may be unintentionally impacted during normal application of a terrestrial herbicide as a result of a direct spray of the receptor or the waterbody inhabited by the receptor, indirect contact with dislodgeable foliar residue after herbicide application, or consumption of prey items sprayed during application. These exposures may occur within the application area (consumption of prey items) or outside of the application area (waterbodies accidentally sprayed during application of terrestrial herbicide). Generally, impacts outside of the intended application area are accidental exposures and are not typical of BLM application practices. The following direct spray scenarios were evaluated:

Direct Spray of Terrestrial Wildlife

Small mammal or Insect 100% Dermal Absorption

$$\text{Surface Areas (A): } \text{cm}^2 = 12.3 \times \text{BW}^{0.65}$$

Where: BW = body weight in grams

Amount deposited on ½ receptor (Amnt): $0.5 \times A \times R$

Where: A = Surface area in cm²

R = Application rate in lb a.i./acre

Small mammal 1st order

Proportion absorbed over period T (Prop): $1 - \exp(-k T)$

Where: k = First order dermal absorption rate (hour⁻¹)

T = Time (24 hours)

Absorbed Dose: Amnt × Prop ÷ BW

Ingestion of Food Items Contaminated by Direct Spray

All herbivorous receptors ingestion acute

Concentration on food (C): $R \times rr$

Where: R = Application rate (lb a.i./acre)

rr = Residue rate as determined from Kenaga nomogram (mg/kg per lb/acre)

Dose estimates (D): $C \times A \div BW$

Where: C = Concentration on food (mg/kg food)

A = Wet weight food ingestion rate (kg/day)

BW = Body Weight

All herbivorous receptors ingestion chronic

Initial concentration on food (C0): $R \times rr \times Drift$

Where: R = Application rate (lb a.i./acre)

rr = Residue rate as determined from Kenaga nomogram (mg/kg per lb/acre)

Drift = 1

Concentration on food at time T: $C0 \times \exp(-k \times T)$

Where: C0 = Concentration on food at time zero (mg/kg food)

k = Decay Coefficient: $\ln(2) \div t_{50}$ (days⁻¹)

T = Time (90 days)

Time-weighted Average Concentration on vegetation (CTWA): $C0 \times (1 - \exp(-k \times T)) \div (k \times T)$

Dose estimates (D): CTWA × A × Prop ÷ BW

Where: CTWA = Time Weighted Concentration on food (mg/kg food)

A = Wet weight food ingestion rate (kg/day)

Prop = Proportion of food impacted by direct spray (100%)

BW = Body Weight

Large carnivorous mammal ingestion acute

Amount deposited on small mammal prey (Amnt_mouse): $0.5 \times \text{SurfaceArea} \times R$

Where: $R = \text{Application rate (lb a.i./acre)}$
 Dose estimates: $\text{Drift} \times \text{Prop} \times \text{Amnt_mouse} \div \text{BW_mouse} \times A \div \text{BW}$
 Where: Drift = 1
 $\text{Prop} = \text{Proportion of food impacted by direct spray (100\%)}$
 $A = \text{Wet weight food ingestion rate (kg/day)}$
 $\text{BW} = \text{Body Weight of carnivore}$
 $\text{BW_mouse} = \text{Body weight of food (small mammal; mouse)}$

Large carnivorous mammal ingestion chronic

Initial concentration on mammal (C0): $0.5 \times \text{SurfaceArea} \times R \div \text{BW_smallmammal}$
 Where: $R = \text{Application rate (lb a.i./acre)}$
 $\text{SurfaceArea} = \text{Surface area of food (small mammal; mouse)}$
 $\text{BW_smallmammal} = \text{Body weight of food (small mammal; mouse)}$

Concentration absorbed in small mammal at time T (C90): $C0 \times \exp(-k \times T)$

Where: $C0 = \text{Concentration on food at time zero (mg/kg food)}$
 $k = \text{Decay Coefficient: } \ln(2)/t_{50} (\text{days}^{-1})$
 $T = \text{Time (90 days)}$

Dose estimates: $C90 \times \text{FIR_coyote} \times \text{Prop} \div \text{BW}$

Where: $C90 = \text{Concentration of herbicide in food at 90 days}$
 $\text{FIR} = \text{Wet weight food ingestion rate (mg/kg-day)}$
 $\text{Prop} = \text{Proportion of food impacted by direct spray (100\%)}$
 $\text{BW} = \text{Body Weight}$

Accidental Direct Spray Over Pond

Mass in Pond (Mp): $Ap \times R$
 Where: $Ap = \text{Area of pond}$
 $R = \text{Application rate (lb a.i./acre)}$

Concentration in Pond: $Mp \div (Vp)$

Where: $Vp = \text{Volume of pond}$

Accidental Direct Spray Over Stream

Mass in Stream Reach (Ms): $As \times R$
 Where: $Ap = \text{Area of stream affected by spray}$
 $R = \text{Application rate (lb a.i./acre)}$

Concentration in Pond: $Ms \div (Vs)$

Where: $Vs = \text{Volume of stream reach affected by spray}$

Off-Site Drift and Surface and Ground Water Runoff

During normal application of herbicides, it is possible for a portion of the herbicide to drift outside of the treatment area and deposit onto non-target receptors. Precipitation may also result in the transport of herbicides bound to soils from the application area via surface runoff and root-zone groundwater flow. To simulate these off-site herbicide transport mechanisms, AgDRIFT® software was used to evaluate a number of possible drift scenarios and GLEAMS software was used to evaluate transport to off-site soils or waterbodies via surface runoff or root-zone ground water flow. These models provide concentrations in media. Details of the model and calculations used to obtain soil and water concentrations are presented in the Methods document (ENSR 2005). The surface water concentrations were used in the ERAs to estimate fish concentrations and consumption of these fish by an avian piscivore. The following presents those calculations:

Consumption of Fish From Contaminated Pond

Concentration in fish = $Cw \times \text{BCF} \times \text{FCM TL2} \times \text{FCM TL3}$
 Where: $Cw = \text{Concentration in water (obtained from model) mg/L}$
 $\text{BCF} = \text{Bioconcentration factor (L/kg fish)}$
 $\text{FCM TL2} = \text{Trophic Level 2 food chain multiplier (unitless)}$
 $\text{FCM TL3} = \text{Trophic Level 3 food chain multiplier (unitless)}$

Dose estimates (D): $C \times A \times \text{Prop} \div \text{BW}$

Where: C = Concentration in fish (mg/kg food)
A = Wet weight food ingestion rate (kg/day)
Prop = Proportion of food impacted (100%)
BW = Body Weight

Accidental Spill to Pond

To represent worst-case potential impacts to ponds, a spill scenario was considered. A truck or helicopter spilling an entire load of herbicide mixed for the maximum application rate into a 1/4 acre, 1 meter deep pond.

Truck or Helicopter Spill into Pond

Concentrations in water (Cw): $C_w = \frac{C_m \times V_{spill}}{V_p}$

Where: Cm = Herbicide concentration in the truck or helicopter mixture (mg a.i./L)
Vspill = Volume of the spill (L)
Vp = Volume of the pond (L)

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General note: Exposure parameters and equations in the following tables are described in more detail in the *Vegetation Treatments Programmatic EIS Ecological Risk Assessment Methodology* (ENSR 2005) and Section 4 of the ecological risk assessment for this herbicide.

TABLE B-1
Derivation of Potential Risks to Terrestrial Receptors Exposed to Imazapic via Direct Spray and Indirect Contact with Contaminated Foliage

Parameter		Pollinating Insect	Small Mammal	Units
Duration of exposure (T)		24	24	hours
Body weight (BW)		0.000093	0.02	kg
Surface areas (A): $\text{cm}^2 = 12.3 \times \text{BW(g)}^{0.65}$ ¹		2.63	86.21	cm^2
Application rates (R)	Typical	0.031	0.031	lb/acre
	Maximum	0.19	0.19	lb/acre
Amount deposited on 1/2 receptor (Amnt): $0.5 \times A \times R \times cf^2$	Typical	0.0004569	0.01498	mg
	Maximum	0.002800	0.09180	mg
Dose Estimate Assuming First Order Dermal Adsorption³				
First-order dermal absorption coefficient (k)	Central estimate	0.09902	0.09902	hour ⁻¹
Proportion absorbed over period T (Prop): $1 - \exp(-k \times T)$ ⁴	Typical	0.06499	0.06499	unitless
	Maximum	0.06499	0.06499	unitless
Absorbed dose: $(\text{Amnt} \times \text{Prop}) / \text{BW}$	Typical	3.19E-01	4.87E-02	mg/kg bw
	Maximum	1.96E+00	2.98E-01	mg/kg bw
Dose Estimate Assuming 100% Dermal Adsorption⁵				
Absorbed dose: $(\text{Amnt} \times \text{Prop}) / \text{BW}$	Typical	4.91E+00	7.49E-01	mg/kg bw
	Maximum	3.01E+01	4.59E+00	mg/kg bw

RISK QUOTIENTS ⁶ - Direct Spray	Toxicity Reference Value (mg/kg bw) ⁷	Typical Application Rate (R)	Maximum Application Rate (R)
Small mammal - 100% absorption	10,227	1.01E-04	6.18E-04
Pollinating insect - 100% absorption	1,075	4.57E-03	2.80E-02
Small mammal - 1st order dermal adsorption	10,227	6.55E-06	4.02E-05
Pollinating insect - 1st order dermal adsorption	1,075	2.97E-04	1.82E-03

RISK QUOTIENTS - Indirect Contact ⁸	Toxicity Reference Value (mg/kg bw) ⁷	Typical Application Rate (R)	Maximum Application Rate (R)
Small mammal - 100% absorption	10,227	1.01E-05	6.18E-05
Pollinating insect - 100% absorption	1,075	4.57E-04	2.80E-03
Small mammal - 1st order dermal adsorption	10,227	6.55E-07	4.02E-06
Pollinating insect - 1st order dermal adsorption	1,075	2.97E-05	1.82E-04

¹Surface area calculation for mammals from Stahl (1967; presented in USEPA 1993). No surface area calculation identified for insects. Mammalian equation used as a surrogate.

²A conversion factor (cf) of 0.011208493 was used to convert the application rate (R) from lb/acre to mg/cm².

³100% dermal absorption - all of the herbicide falling on the receptor was assumed to penetrate the skin within 24 hours.

⁴1st order dermal absorption - absorption occurs over 24 hours, taking into consideration the potential for some herbicide to not be absorbed.

⁵ $\exp(-k \times T) = e^{-k \times T}$, where e is a constant = 2.7828.

⁶Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁷Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

⁸Exposure from indirect contact assumed to be 1/10 of direct spray exposure (Harris and Solomon 1992).

TABLE B-2
Potential Risks to Small Herbivorous/Omnivorous Mammal (Deer Mouse) from Consumption of Contaminated Fruit (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		0.02	kg
Food ingestion rate (dry weight [dw])¹		0.003364	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		0.01463	kg ww/day
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - berries (rr)³	Typical	5.4	mg/kg per lb/acre
	Maximum	40.7	mg/kg per lb/acre
Concentration on berries (C): R × rr	Typical	0.1674	mg/kg fruit
	Maximum	7.733	mg/kg fruit
Dose estimates (D): (C × ir) / BW	Typical	1.22E-01	mg/kg bw
	Maximum	5.66E+00	mg/kg bw

RISK QUOTIENTS ⁴ - Ingestion	Toxicity Reference Value (mg/kg bw) ⁵	Typical Application Rate (R)	Maximum Application Rate (R)
Small mammalian herbivore/omnivore (acute exposure)	10,227	1.20E-05	5.53E-04

¹Calculated using algorithm developed by Nagy (1987) for rodents; where food ingestion rate (g dw/day) = 0.621× (BW g)^0.564; converted into kg dw/day.

²Assumes fruit is 77% water (USEPA 1993; Table 4-2 - value for fruit pulp and skin).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.

⁴Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁵Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-3
Potential Risks to Small Herbivorous/Omnivorous Mammal (Deer Mouse) from Consumption of Contaminated Fruit (Chronic Exposure Scenario)

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	days
Body weight (BW)		0.02	kg
Food ingestion rate (dry weight [dw])¹		0.003364	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		0.01463	kg ww/day
Half life on vegetation (t₅₀)	Herbicide specific	7	days
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - berries (rr)³	Typical	5.4	mg/kg per lb/acre
	Maximum	40.7	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t₅₀⁴	Typical	0.0990	days ⁻¹
	Maximum	0.0990	days ⁻¹
Initial concentration on berries (C₀): R × rr × Drift	Typical	0.1674	mg/kg fruit
	Maximum	7.733	mg/kg fruit
Concentration on berries at time T: C₀ × exp(-k×T)⁵	Typical	0.0000	mg/kg fruit
	Maximum	0.0010	mg/kg fruit
Time-weighted average concentration on vegetation (CTWA): C₀ × (1-exp(-k×T)) / (k×T)⁵	Typical	0.0188	mg/kg fruit
	Maximum	0.8676	mg/kg fruit
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): (CTWA × ir × pc) / BW	Typical	1.37E-02	mg/kg bw/day
	Maximum	6.35E-01	mg/kg bw/day

RISK QUOTIENTS ⁶ – Ingestion	Toxicity Reference Value (mg/kg bw/day) ⁷	Typical Application Rate (R)	Maximum Application Rate (R)
Small mammalian herbivore/omnivore (chronic exposure)	3,534	3.89E-06	1.80E-04

¹Calculated using algorithm developed by Nagy (1987) for rodents; where food ingestion rate (g dw/day) = 0.621×(BW g)^{0.564}; converted into kg dw/day.

²Assumes fruit is 77% water (USEPA 1993; Table 4-2 - value for fruit pulp and skin).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.

⁴ln = Natural log function.

⁵ $\exp(-k \times T) = e^{-k \times T}$, where e is a constant = 2.7828.

⁶Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁷Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-4
**Potential Risks to Large Herbivorous Mammal (Mule Deer) from Consumption of Contaminated Vegetation
(Acute Exposure Scenario)**

Parameters/Assumptions		Value	Units
Body weight (BW)		70	kg
Food ingestion rate (dry weight [dw])¹		1.9212	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		6.4038	kg ww/day
Duration of exposure (D)		1	day
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - grass (rr)³	Typical	36	mg/kg per lb/acre
	Maximum	197	mg/kg per lb/acre
Concentration on grass (C): R × rr	Typical	1.116	mg/kg grass
	Maximum	37.43	mg/kg grass
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: (Drift × pc × C × ir) / BW	Typical	1.02E-01	mg/kg bw/day
	Maximum	3.42E+00	mg/kg bw/day

RISK QUOTIENTS ⁴ - Ingestion	Toxicity Reference Value (mg/kg bw/day) ⁵	Typical Application Rate (R)	Maximum Application Rate (R)
Large mammalian herbivore/gramivore (acute exposure)	1330	7.68E-05	2.57E-03

¹Calculated using algorithm developed by Nagy (1987) for herbivores; where food ingestion rate (g dw/day) = 0.577×(BW g)^0.727; converted into kg dw/day.

²Assumes grass is 70% water (USEPA 1993; Table 4-2 - lowest value for young grasses).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.

⁴Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁵Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-5
**Potential Risks to Large Herbivorous Mammal (Mule Deer) from Consumption of Contaminated Vegetation
(Chronic Exposure Scenario)**

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		70	kg
Food ingestion rate (dry weight [dw])¹		1.9212	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		6.4038	kg ww/day
Half life on vegetation (t₅₀)	Herbicide specific	7	days
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - grass (rr)³	Typical	36	mg/kg per lb/acre
	Maximum	197	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t₅₀⁴	Typical	0.0990	days ⁻¹
	Maximum	0.0990	days ⁻¹
Initial concentration on grass (C₀): R × rr × Drift	Typical	1.116	mg/kg grass
	Maximum	37.43	mg/kg grass
Concentration on grass at time T: C₀ × exp(-k×T)⁵	Typical	0.0002	mg/kg grass
	Maximum	0.0050	mg/kg grass
Time-weighted Average Concentration on vegetation (CTWA): C₀ × (1-exp(-k×T)) / (k× T)⁵	Typical	0.1252	mg/kg vegetation
	Maximum	4.1994	mg/kg vegetation
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: CTWA × ir × pc / BW	Typical	1.15E-02	mg/kg bw/day
	Maximum	3.84E-01	mg/kg bw/day

RISK QUOTIENTS ⁶ - Ingestion	Toxicity Reference Value (mg/kg bw/day) ⁷	Typical Application Rate (R)	Maximum Application Rate (R)
Large mammalian herbivore/gramivore (chronic exposure)	30	3.82E-04	1.28E-02

¹Calculated using algorithm developed by Nagy (1987) for herbivores; where food ingestion rate (g dw/day) = 0.577×(BW g)^{0.727}; converted into kg dw/day.

²Assumes grass is 70% water (USEPA 1993; Table 4-2 - lowest value for young grasses).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.

⁴ln = Natural log function.

⁵exp(-k×T) = e^{-(k×T)}, where e is a constant = 2.7828.

⁶Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁷Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-6
Potential Risks to Carnivorous Mammal (Coyote) from Consumption of Small Mammals (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight carnivorous mammal (BW)		12	kg
Body weight small mammal (BW_mouse)		0.02	kg
Food ingestion rate (dry weight [dw])¹		0.5297	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		1.6554	kg ww/day
Duration of exposure (D)		1	day
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Amount deposited on small mammal prey (Amnt_mouse): $0.5 \times A \times R^3$	Typical	0.01498	mg
	Maximum	0.09180	mg
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: $([(Drift \times pc \times Amnt_mouse) / BW_mouse] \times ir) / BW$	Typical	1.03E-01	mg/kg bw
	Maximum	6.33E-01	mg/kg bw

RISK QUOTIENTS ⁴ - Ingestion	Toxicity Reference Value(mg/kg bw) ⁵	Typical Application Rate (R)	Maximum Application Rate (R)
Large carnivorous mammal (acute exposure)	2,066	5.00E-05	3.06E-04

¹Calculated using algorithm developed by Nagy (1987); where food ingestion rate (g dw/day) = 0.0687×(BW g)^0.822; converted into kg dw/day.

²Assumes mammals are 68% water (USEPA 1993).

³Surface area (A) and body weight of mouse receptor presented in Table B-1. Surface area calculation for mammals from Stahl (1967; presented in USEPA 1993).

⁴Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁵Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-7
**Potential Risks to Carnivorous Mammal (Coyote) from Consumption of Contaminated Small Mammals
(Chronic Exposure Scenario)**

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		12	kg
Body weight small mammal (BW_mouse)		0.02	kg
Food ingestion rate (dry weight [dw])¹		0.5297	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		1.6554	kg ww/day
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): $\ln(2) / t_{50}$³	Typical	0.09902	days ⁻¹
	Maximum	0.09902	days ⁻¹
Initial concentration on small mammal (C₀): $0.5 \times A \times R / BW_{\text{mouse}}$	Typical	0.7489	mg/kg mammal
	Maximum	4.5898	mg/kg mammal
Concentration absorbed in small mammal at time T (C₉₀): $C_0 \times \exp(-k \times T)$⁴	Typical	0.04867	mg/kg mammal
	Maximum	0.2983	mg/kg mammal
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: $(C_{90} \times ir \times pc) / BW$	Typical	6.71E-03	mg/kg bw/day
	Maximum	4.11E-02	mg/kg bw/day

RISK QUOTIENTS ⁵ - Ingestion	Toxicity Reference Value (mg/kg bw/day) ⁶	Typical Application Rate (R)	Maximum Application Rate (R)
Large carnivorous mammal (chronic exposure)	47	1.43E-04	8.76E-04

¹Calculated using algorithm developed by Nagy (1987); where food ingestion rate (g dw/day) = 0.0687×(BW g)^{0.822}; converted into kg dw/day.

²Assumes mammals are 68% water (USEPA 1993).

³ln = Natural log function.

⁴ $\exp(-k \times T) = e^{(-k \times T)}$, where e is a constant = 2.7828.

⁵Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁶Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-8
Potential Risks to Insectivorous Bird (American Robin) from Consumption of Contaminated Insects (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		0.08	kg
Food ingestion rate (dry weight [dw])¹		0.01124	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		0.03626	kg ww/day
Duration of exposure (D)		1	day
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - insects (rr)³	Typical	45	mg/kg per lb/acre
	Maximum	350	mg/kg per lb/acre
Concentration on insects (C): R × rr	Typical	1.395	mg/kg insect
	Maximum	66.5	mg/kg insect
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: (Drift × pc × C × ir) / BW	Typical	6.32E-01	mg/kg bw
	Maximum	3.01E+01	mg/kg bw

RISK QUOTIENTS ⁴ - Ingestion	Toxicity Reference Value (mg/kg bw) ⁵	Typical Application Rate (R)	Maximum Application Rate (R)
Small insectivorous bird (acute exposure)	15095	4.19E-05	2.00E-03

¹Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^{0.651}.

²Assumes insects are 69% water (USEPA 1993; Table 4-1 - value for grasshoppers and crickets).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994).

⁴Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁵Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-9
**Potential Risks to Insectivorous Bird (American Robin) from Consumption of Contaminated Insects
(Chronic Exposure Scenario)**

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		0.08	kg
Food ingestion rate (dry weight [dw])¹		0.01124	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		0.03626	kg ww/day
Half life on insect (t_{50})	Herbicide specific	7	days
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - insects (rr)³	Typical	45	mg/kg per lb/acre
	Maximum	350	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): $\ln(2) / t_{50}$⁴	Typical	0.0990	days ⁻¹
	Maximum	0.0990	days ⁻¹
Initial concentration on insects (C_0): $R \times rr \times Drift$	Typical	1.395	mg/kg insect
	Maximum	66.5	mg/kg insect
Concentration on insects at time T (C_{90}): $C_0 \times \exp(-k \times T)$⁵	Typical	0.0002	mg/kg insect
	Maximum	0.0090	mg/kg insect
Time-weighted average concentration on insects (CTWA): $C_0 \times (1 - \exp(-k \times T)) / (k \times T)$⁵	Typical	0.1565	mg/kg insect
	Maximum	7.4609	mg/kg insect
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): $(CTWA \times ir \times pc) / BW$	Typical	7.09E-02	mg/kg bw/day
	Maximum	3.38E+00	mg/kg bw/day

RISK QUOTIENTS ⁶ - Ingestion	Toxicity Reference Value (mg/kg bw/day) ⁷	Typical Application Rate (R)	Maximum Application Rate (R)
Small insectivorous bird - chronic exposure	113	6.28E-04	2.99E-02

¹Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^{0.651}.

²Assumes insects are 69% water (USEPA 1993; Table 4-1 - value for grasshoppers and crickets).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994).

⁴In = Natural log function.

⁵ $\exp(-k \times T) = e^{-k \times T}$, where e is a constant = 2.7828.

⁶Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁷Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-10
Potential Risks to Herbivorous Bird (Canada Goose) from Consumption of Contaminated Vegetation (Acute Exposure Scenario)

Parameters/Assumptions		Value	Units
Body weight (BW)		3.72	kg
Food ingestion rate (dry weight [dw])¹		0.1369	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		0.9125	kg ww/day
Duration of exposure (D)		1	day
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - vegetation (rr)³	Typical	35	mg/kg per lb/acre
	Maximum	296	mg/kg per lb/acre
Concentration on vegetation (C): R × rr	Typical	1.085	mg/kg veg
	Maximum	56.24	mg/kg veg
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates: (Drift × pc × C × ir) / BW	Typical	2.66E-01	mg/kg bw
	Maximum	1.38E+01	mg/kg bw

RISK QUOTIENTS ⁴ - Ingestion	Toxicity Reference Value (mg/kg bw) ⁵	Typical Application Rate (R)	Maximum Application Rate (R)
Large herbivorous bird (acute exposure)	2,500	1.06E-04	5.52E-03

¹Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^{0.651}.

²Assumes vegetation is 85% water (USEPA 1993; Table 4-2 - value for dicotyledons).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.

⁴Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁵Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-11
**Potential Risks to Herbivorous Bird (Canada Goose) from Consumption of Contaminated Vegetation
(Chronic Exposure Scenario)**

Parameters/Assumptions		Value	Units
Duration of exposure (T)		90	day
Body weight (BW)		3.72	kg
Food ingestion rate (dry weight [dw])¹		0.1369	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²		0.9125	kg ww/day
Half life on vegetation (t₅₀)	Herbicide specific	7	days
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Residue rate - vegetation (rr)³	Typical	35	mg/kg per lb/acre
	Maximum	296	mg/kg per lb/acre
Drift (Drift)	Typical	1	unitless
	Maximum	1	unitless
Decay coefficient (k): ln(2) / t₅₀⁴	Typical	0.0990	days ⁻¹
	Maximum	0.0990	days ⁻¹
Initial concentration on vegetation (C₀): R × rr × Drift	Typical	1.085	mg/kg veg
	Maximum	56.24	mg/kg veg
Concentration on vegetation at time T (C₉₀): C₀ × exp(-k×T)⁵	Typical	0.0001	mg/kg veg
	Maximum	0.0076	mg/kg veg
Time-weighted average concentration on vegetation (CTWA): C₀ × (1-exp(-k×T))/(k×T)	Typical	0.1217	mg/kg veg
	Maximum	6.3098	mg/kg veg
Proportion of diet contaminated (pc)	Typical	1	unitless
	Maximum	1	unitless
Dose estimates (D): (CTWA × ir × pc) / BW	Typical	2.99E-02	mg/kg bw/day
	Maximum	1.55E+00	mg/kg bw/day

RISK QUOTIENTS ⁶ - Ingestion	Toxicity Reference Value (mg/kg bw/day) ⁷	Typical Application Rate (R)	Maximum Application Rate (R)
Large herbivorous bird (chronic exposure)	65	4.59E-04	2.38E-02

¹Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^{0.651}.

²Assumes vegetation is 85% water (USEPA 1993; Table 4-2 - value for dicotyledons).

³Residue rates were obtained from the Kenaga nomogram as updated (Fletcher et al. 1994) and are vegetation-specific.

⁴ln = Natural log function.

⁵exp(-k×T) = e^{-(k×T)}, where e is a constant = 2.7828.

⁶Risk Quotient = Estimated Dose/Toxicity Reference Value.

⁷Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

TABLE B-12
Potential Risks to Aquatic Species from Accidental Spray Drift to Pond

OFF-SITE DRIFT - modeled in AgDrift TYPICAL APPLICATION RATE									
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Pond Concentration (mg/L)	Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
				Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Plane	Forested	100	6.79E-04	6.79E-06	6.79E-06	1.61E-01	2.06E-05	7.07E-06	2.61E-01
Plane	Forested	300	2.88E-04	2.88E-06	2.88E-06	6.81E-02	8.73E-06	3.00E-06	1.11E-01
Plane	Forested	900	9.37E-05	9.37E-07	9.37E-07	2.22E-02	2.84E-06	9.76E-07	3.60E-02
Plane	Non-Forested	100	1.56E-04	1.56E-06	1.56E-06	3.69E-02	4.73E-06	1.63E-06	6.00E-02
Plane	Non-Forested	300	6.41E-05	6.41E-07	6.41E-07	1.52E-02	1.94E-06	6.68E-07	2.47E-02
Plane	Non-Forested	900	2.93E-05	2.93E-07	2.93E-07	6.93E-03	8.88E-07	3.05E-07	1.13E-02
Helicopter	Forested	100	3.26E-04	3.26E-06	3.26E-06	7.71E-02	9.88E-06	3.40E-06	1.25E-01
Helicopter	Forested	300	9.59E-05	9.59E-07	9.59E-07	2.27E-02	2.91E-06	9.99E-07	3.69E-02
Helicopter	Forested	900	2.55E-05	2.55E-07	2.55E-07	6.03E-03	7.73E-07	2.66E-07	9.81E-03
Helicopter	Non-Forested	100	1.32E-04	1.32E-06	1.32E-06	3.12E-02	4.00E-06	1.38E-06	5.08E-02
Helicopter	Non-Forested	300	4.89E-05	4.89E-07	4.89E-07	1.16E-02	1.48E-06	5.09E-07	1.88E-02
Helicopter	Non-Forested	900	2.26E-05	2.26E-07	2.26E-07	5.34E-03	6.85E-07	2.35E-07	8.69E-03
Ground	Low Boom	25	2.13E-05	2.13E-07	2.13E-07	5.04E-03	6.45E-07	2.22E-07	8.19E-03
Ground	Low Boom	100	1.17E-05	1.17E-07	1.17E-07	2.77E-03	3.55E-07	1.22E-07	4.50E-03
Ground	Low Boom	900	2.26E-06	2.26E-08	2.26E-08	5.34E-04	6.85E-08	2.35E-08	8.69E-04
Ground	High Boom	25	3.43E-05	3.43E-07	3.43E-07	8.11E-03	1.04E-06	3.57E-07	1.32E-02
Ground	High Boom	100	1.81E-05	1.81E-07	1.81E-07	4.28E-03	5.48E-07	1.89E-07	6.96E-03
Ground	High Boom	900	2.87E-06	2.87E-08	2.87E-08	6.78E-04	8.70E-08	2.99E-08	1.10E-03

TABLE B-12 (Cont.)

Potential Risks to Aquatic Species from Accidental Spray Drift to Pond

OFF-SITE DRIFT - modeled in AgDrift MAXIMUM APPLICATION RATE									
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Pond Concentration (mg/L)	Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
				Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Plane	Forested	100	4.54E-03	4.54E-05	4.54E-05	1.07E+00	1.38E-04	4.73E-05	1.75E+00
Plane	Forested	300	1.95E-03	1.95E-05	1.95E-05	4.61E-01	5.91E-05	2.03E-05	7.50E-01
Plane	Forested	900	6.53E-04	6.53E-06	6.53E-06	1.54E-01	1.98E-05	6.80E-06	2.51E-01
Plane	Non-Forested	100	1.15E-03	1.15E-05	1.15E-05	2.72E-01	3.48E-05	1.20E-05	4.42E-01
Plane	Non-Forested	300	5.38E-04	5.38E-06	5.38E-06	1.27E-01	1.63E-05	5.60E-06	2.07E-01
Plane	Non-Forested	900	2.50E-04	2.50E-06	2.50E-06	5.91E-02	7.58E-06	2.60E-06	9.62E-02
Helicopter	Forested	100	1.99E-03	1.99E-05	1.99E-05	4.70E-01	6.03E-05	2.07E-05	7.65E-01
Helicopter	Forested	300	5.81E-04	5.81E-06	5.81E-06	1.37E-01	1.76E-05	6.05E-06	2.23E-01
Helicopter	Forested	900	1.55E-04	1.55E-06	1.55E-06	3.66E-02	4.70E-06	1.61E-06	5.96E-02
Helicopter	Non-Forested	100	1.00E-03	1.00E-05	1.00E-05	2.36E-01	3.03E-05	1.04E-05	3.85E-01
Helicopter	Non-Forested	300	4.21E-04	4.21E-06	4.21E-06	9.95E-02	1.28E-05	4.39E-06	1.62E-01
Helicopter	Non-Forested	900	1.81E-04	1.81E-06	1.81E-06	4.28E-02	5.48E-06	1.89E-06	6.96E-02
Ground	Low Boom	25	1.28E-04	1.28E-06	1.28E-06	3.03E-02	3.88E-06	1.33E-06	4.92E-02
Ground	Low Boom	100	7.01E-05	7.01E-07	7.01E-07	1.66E-02	2.12E-06	7.30E-07	2.70E-02
Ground	Low Boom	900	1.35E-05	1.35E-07	1.35E-07	3.19E-03	4.09E-07	1.41E-07	5.19E-03
Ground	High Boom	25	2.05E-04	2.05E-06	2.05E-06	4.85E-02	6.22E-06	2.14E-06	7.89E-02
Ground	High Boom	100	1.08E-04	1.08E-06	1.08E-06	2.55E-02	3.27E-06	1.13E-06	4.15E-02
Ground	High Boom	900	1.72E-05	1.72E-07	1.72E-07	4.07E-03	5.21E-07	1.79E-07	6.62E-03

¹Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-13
Potential Risks to Aquatic Species from Accidental Spray Drift to Stream

OFF-SITE DRIFT - modeled in AgDrift TYPICAL APPLICATION RATE									
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Stream Concentration (mg/L)	Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
				Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Plane	Forested	100	9.30E-04	9.30E-06	9.30E-06	2.20E-01	2.82E-05	9.69E-06	3.58E-01
Plane	Forested	300	3.31E-04	3.31E-06	3.31E-06	7.83E-02	1.00E-05	3.45E-06	1.27E-01
Plane	Forested	900	9.77E-05	9.77E-07	9.77E-07	2.31E-02	2.96E-06	1.02E-06	3.76E-02
Plane	Non-Forested	100	2.29E-04	2.29E-06	2.29E-06	5.42E-02	6.95E-06	2.39E-06	8.82E-02
Plane	Non-Forested	300	6.99E-05	6.99E-07	6.99E-07	1.65E-02	2.12E-06	7.28E-07	2.69E-02
Plane	Non-Forested	900	3.04E-05	3.04E-07	3.04E-07	7.18E-03	9.20E-07	3.16E-07	1.17E-02
Helicopter	Forested	100	6.26E-04	6.26E-06	6.26E-06	1.48E-01	1.90E-05	6.52E-06	2.41E-01
Helicopter	Forested	300	1.12E-04	1.12E-06	1.12E-06	2.64E-02	3.39E-06	1.17E-06	4.30E-02
Helicopter	Forested	900	2.68E-05	2.68E-07	2.68E-07	6.34E-03	8.13E-07	2.79E-07	1.03E-02
Helicopter	Non-Forested	100	1.97E-04	1.97E-06	1.97E-06	4.66E-02	5.98E-06	2.05E-06	7.59E-02
Helicopter	Non-Forested	300	5.70E-05	5.70E-07	5.70E-07	1.35E-02	1.73E-06	5.94E-07	2.19E-02
Helicopter	Non-Forested	900	2.35E-05	2.35E-07	2.35E-07	5.55E-03	7.11E-07	2.44E-07	9.03E-03
Ground	Low Boom	25	3.84E-05	3.84E-07	3.84E-07	9.09E-03	1.16E-06	4.00E-07	1.48E-02
Ground	Low Boom	100	1.13E-05	1.13E-07	1.13E-07	2.66E-03	3.41E-07	1.17E-07	4.33E-03
Ground	Low Boom	900	1.16E-06	1.16E-08	1.16E-08	2.74E-04	3.51E-08	1.21E-08	4.46E-04
Ground	High Boom	25	6.41E-05	6.41E-07	6.41E-07	1.52E-02	1.94E-06	6.68E-07	2.47E-02
Ground	High Boom	100	1.82E-05	1.82E-07	1.82E-07	4.31E-03	5.52E-07	1.90E-07	7.01E-03
Ground	High Boom	900	1.53E-06	1.53E-08	1.53E-08	3.62E-04	4.65E-08	1.60E-08	5.90E-04

TABLE B-13 (Cont.)

Potential Risks to Aquatic Species from Accidental Spray Drift to Stream

OFF-SITE DRIFT - modeled in AgDrift MAXIMUM APPLICATION RATE									
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Stream Concentration (mg/L)	Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
				Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
Plane	Forested	100	6.13E-03	6.13E-05	6.13E-05	1.45E+00	1.86E-04	6.39E-05	2.36E+00
Plane	Forested	300	2.24E-03	2.24E-05	2.24E-05	5.31E-01	6.80E-05	2.34E-05	8.63E-01
Plane	Forested	900	6.78E-04	6.78E-06	6.78E-06	1.60E-01	2.06E-05	7.07E-06	2.61E-01
Plane	Non-Forested	100	1.62E-03	1.62E-05	1.62E-05	3.82E-01	4.90E-05	1.68E-05	6.22E-01
Plane	Non-Forested	300	5.92E-04	5.92E-06	5.92E-06	1.40E-01	1.79E-05	6.17E-06	2.28E-01
Plane	Non-Forested	900	2.57E-04	2.57E-06	2.57E-06	6.08E-02	7.79E-06	2.68E-06	9.89E-02
Helicopter	Forested	100	3.80E-03	3.80E-05	3.80E-05	8.99E-01	1.15E-04	3.96E-05	1.46E+00
Helicopter	Forested	300	6.82E-04	6.82E-06	6.82E-06	1.61E-01	2.07E-05	7.11E-06	2.62E-01
Helicopter	Forested	900	1.63E-04	1.63E-06	1.63E-06	3.85E-02	4.94E-06	1.70E-06	6.27E-02
Helicopter	Non-Forested	100	1.42E-03	1.42E-05	1.42E-05	3.35E-01	4.29E-05	1.48E-05	5.45E-01
Helicopter	Non-Forested	300	4.71E-04	4.71E-06	4.71E-06	1.11E-01	1.43E-05	4.90E-06	1.81E-01
Helicopter	Non-Forested	900	1.88E-04	1.88E-06	1.88E-06	4.44E-02	5.69E-06	1.95E-06	7.22E-02
Ground	Low Boom	25	2.29E-04	2.29E-06	2.29E-06	5.42E-02	6.95E-06	2.39E-06	8.82E-02
Ground	Low Boom	100	6.73E-05	6.73E-07	6.73E-07	1.59E-02	2.04E-06	7.01E-07	2.59E-02
Ground	Low Boom	900	6.94E-06	6.94E-08	6.94E-08	1.64E-03	2.10E-07	7.23E-08	2.67E-03
Ground	High Boom	25	3.84E-04	3.84E-06	3.84E-06	9.09E-02	1.16E-05	4.00E-06	1.48E-01
Ground	High Boom	100	1.09E-04	1.09E-06	1.09E-06	2.58E-02	3.30E-06	1.14E-06	4.19E-02
Ground	High Boom	900	9.18E-06	9.18E-08	9.18E-08	2.17E-03	2.78E-07	9.56E-08	3.53E-03

¹Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-14
Potential Risks to Non-Target Terrestrial Plants from Direct Spray and Spray Drift

DIRECT SPRAY	Terrestrial Concentration (lb/acre)¹	Typical Species RQ²	Rare, Threatened, and Endangered Species RQ²
Typical application rate	0.031	3.10E+00	3.88E+00
Maximum application rate	0.19	1.90E+01	2.38E+01

OFF-SITE DRIFT - modeled in AgDrift					
TYPICAL APPLICATION RATE					
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Soil Concentration (lb/acre)¹	Typical Species RQ²	Rare, Threatened, and Endangered Species RQ²
Plane	Forested	100	8.50E-03	8.50E-01	1.06E+00
Plane	Forested	300	3.00E-03	3.00E-01	3.75E-01
Plane	Forested	900	9.00E-04	9.00E-02	1.13E-01
Plane	Non-Forested	100	2.10E-03	2.10E-01	2.63E-01
Plane	Non-Forested	300	7.00E-04	7.00E-02	8.75E-02
Plane	Non-Forested	900	3.00E-04	3.00E-02	3.75E-02
Helicopter	Forested	100	5.80E-03	5.80E-01	7.25E-01
Helicopter	Forested	300	1.00E-03	1.00E-01	1.25E-01
Helicopter	Forested	900	2.00E-04	2.00E-02	2.50E-02
Helicopter	Non-Forested	100	1.80E-03	1.80E-01	2.25E-01
Helicopter	Non-Forested	300	5.00E-04	5.00E-02	6.25E-02
Helicopter	Non-Forested	900	2.00E-04	2.00E-02	2.50E-02
Ground	Low Boom	25	4.00E-04	4.00E-02	5.00E-02
Ground	Low Boom	100	1.00E-04	1.00E-02	1.25E-02
Ground	Low Boom	900	2.13E-05	2.13E-03	2.66E-03
Ground	High Boom	25	6.00E-04	6.00E-02	7.50E-02
Ground	High Boom	100	2.00E-04	2.00E-02	2.50E-02
Ground	High Boom	900	2.73E-05	2.73E-03	3.41E-03

TABLE B-14 (Cont.)
Potential Risks to Non-Target Terrestrial Plants from Direct Spray and Spray Drift

OFF-SITE DRIFT - modeled in AgDrift MAXIMUM APPLICATION RATE					
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Soil Concentration (lb/acre) ¹	Typical Species RQ ²	Rare, Threatened, and Endangered Species RQ ²
Plane	Forested	100	5.58E-02	5.58E+00	6.98E+00
Plane	Forested	300	2.04E-02	2.04E+00	2.55E+00
Plane	Forested	900	6.20E-03	6.20E-01	7.75E-01
Plane	Non-Forested	100	1.47E-02	1.47E+00	1.84E+00
Plane	Non-Forested	300	5.40E-03	5.40E-01	6.75E-01
Plane	Non-Forested	900	2.30E-03	2.30E-01	2.88E-01
Helicopter	Forested	100	3.49E-02	3.49E+00	4.36E+00
Helicopter	Forested	300	6.30E-03	6.30E-01	7.88E-01
Helicopter	Forested	900	1.50E-03	1.50E-01	1.88E-01
Helicopter	Non-Forested	100	1.29E-02	1.29E+00	1.61E+00
Helicopter	Non-Forested	300	4.30E-03	4.30E-01	5.38E-01
Helicopter	Non-Forested	900	1.70E-03	1.70E-01	2.13E-01
Ground	Low Boom	25	2.40E-03	2.40E-01	3.00E-01
Ground	Low Boom	100	8.00E-04	8.00E-02	1.00E-01
Ground	Low Boom	900	1.00E-04	1.00E-02	1.25E-02
Ground	High Boom	25	3.90E-03	3.90E-01	4.88E-01
Ground	High Boom	100	1.30E-03	1.30E-01	1.63E-01
Ground	High Boom	900	2.00E-04	2.00E-02	2.50E-02

¹a.i. = active ingredient.

²RQ = Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-15
Potential Risk to Predatory Bird from Consumption of Contaminated Fish from Pond (Pond Impacted by Spray Drift Modeled in AgDrift)

Parameters/ Assumptions	Value	Units
Body weight (BW)	5.15	kg
Food ingestion rate (dry weight [dw])¹	0.1018	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²	0.4071	kg ww/day
Bioconcentration factor (BCF)	0.11	L/kg fish
Proportion of diet contaminated (pc)	1	unitless
Toxicity reference value (TRV)³	65	mg/kg-bw/day

TYPICAL APPLICATION RATE						
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Pond Concentration (C_{pond} mg/L) ⁴	Concentration in fish (C_{Fish}): $C_{pond} \times BCF$	Dose estimate (D): $(C_{Fish} \times ir \times pc) / BW$	Risk Quotient ⁵
Plane	Forested	100	6.79E-04	7.47E-05	5.90E-06	9.08E-08
Plane	Forested	300	2.88E-04	3.17E-05	2.50E-06	3.85E-08
Plane	Forested	900	9.37E-05	1.03E-05	8.15E-07	1.25E-08
Plane	Non-Forested	100	1.56E-04	1.72E-05	1.36E-06	2.09E-08
Plane	Non-Forested	300	6.41E-05	7.05E-06	5.57E-07	8.58E-09
Plane	Non-Forested	900	2.93E-05	3.22E-06	2.55E-07	3.92E-09
Helicopter	Forested	100	3.26E-04	3.59E-05	2.83E-06	4.36E-08
Helicopter	Forested	300	9.59E-05	1.05E-05	8.34E-07	1.28E-08
Helicopter	Forested	900	2.55E-05	2.81E-06	2.22E-07	3.41E-09
Helicopter	Non-Forested	100	1.32E-04	1.45E-05	1.15E-06	1.77E-08
Helicopter	Non-Forested	300	4.89E-05	5.38E-06	4.25E-07	6.54E-09
Helicopter	Non-Forested	900	2.26E-05	2.49E-06	1.97E-07	3.02E-09
Ground	Low Boom	25	2.13E-05	2.34E-06	1.85E-07	2.85E-09
Ground	Low Boom	100	1.17E-05	1.29E-06	1.02E-07	1.57E-09
Ground	Low Boom	900	2.26E-06	2.49E-07	1.97E-08	3.02E-10
Ground	High Boom	25	3.43E-05	3.77E-06	2.98E-07	4.59E-09
Ground	High Boom	100	1.81E-05	1.99E-06	1.57E-07	2.42E-09
Ground	High Boom	900	2.87E-06	3.16E-07	2.50E-08	3.84E-10

TABLE B-15 (Cont.)

Potential Risk to Predatory Bird from Consumption of Contaminated Fish from Pond (Pond Impacted by Spray Drift Modeled in AgDrift)

MAXIMUM APPLICATION RATE						
Mode of Application	Application Height or Type	Distance From Receptor (ft)	Pond Concentration (C_{pond} mg/L) ⁴	Concentration in fish (C_{fish}): $(C_{fish} \times ir \times pc) / C_{pond} \times BCF$	Dose estimate (D): $(C_{fish} \times ir \times pc) / BW$	Risk Quotient ⁵
Plane	Forested	100	4.54E-03	4.99E-04	3.95E-05	6.07E-07
Plane	Forested	300	1.95E-03	2.15E-04	1.70E-05	2.61E-07
Plane	Forested	900	6.53E-04	7.18E-05	5.68E-06	8.74E-08
Plane	Non-Forested	100	1.15E-03	1.27E-04	1.00E-05	1.54E-07
Plane	Non-Forested	300	5.38E-04	5.92E-05	4.68E-06	7.20E-08
Plane	Non-Forested	900	2.50E-04	2.75E-05	2.17E-06	3.34E-08
Helicopter	Forested	100	1.99E-03	2.19E-04	1.73E-05	2.66E-07
Helicopter	Forested	300	5.81E-04	6.39E-05	5.05E-06	7.77E-08
Helicopter	Forested	900	1.55E-04	1.71E-05	1.35E-06	2.07E-08
Helicopter	Non-Forested	100	1.00E-03	1.10E-04	8.70E-06	1.34E-07
Helicopter	Non-Forested	300	4.21E-04	4.63E-05	3.66E-06	5.63E-08
Helicopter	Non-Forested	900	1.81E-04	1.99E-05	1.57E-06	2.42E-08
Ground	Low Boom	25	1.28E-04	1.41E-05	1.11E-06	1.71E-08
Ground	Low Boom	100	7.01E-05	7.71E-06	6.10E-07	9.38E-09
Ground	Low Boom	900	1.35E-05	1.49E-06	1.17E-07	1.81E-09
Ground	High Boom	25	2.05E-04	2.26E-05	1.78E-06	2.75E-08
Ground	High Boom	100	1.08E-04	1.19E-05	9.39E-07	1.44E-08
Ground	High Boom	900	1.72E-05	1.89E-06	1.50E-07	2.30E-09

¹Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^{0.651}.

²Assumes fish are 75% water (USEPA 1993; Table 4-1 - value for bony fishes).

³Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

⁴Pond concentrations in spray drift scenarios were calculated by the AgDRIFT. See associated report methodology document for further details.

⁵Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-16
Potential Risks to Aquatic Species from Surface Runoff to Pond

SURFACE RUNOFF - modeled in GLEAMS - TYPICAL APPLICATION RATE														
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients ¹ - Acute		Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates
G_BASE_SAND_0														
05_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_0														
05_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_														
005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_0														
10_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	6.98E-05	1.24E-05	6.98E-07	6.98E-07	1.65E-02	3.76E-07	1.29E-07
G_BASE_CLAY_0														
10_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	2.33E-04	1.06E-05	2.33E-06	2.33E-06	5.51E-02	3.22E-07	1.11E-07
G_BASE_LOAM_														
010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	2.06E-06	1.75E-07	2.06E-08	2.06E-08	4.86E-04	5.31E-09	1.83E-09
G_BASE_SAND_0														
25_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	1.38E-03	6.30E-04	1.38E-05	1.38E-05	3.26E-01	1.91E-05	6.56E-06
G_BASE_CLAY_0														
25_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	5.03E-04	4.28E-05	5.03E-06	5.03E-06	1.19E-01	1.30E-06	4.46E-07
G_BASE_LOAM_														
025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	2.22E-05	9.14E-06	2.22E-07	2.22E-07	5.25E-03	2.77E-07	9.52E-08
G_BASE_SAND_0														
50_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	1.69E-03	8.18E-04	1.69E-05	1.69E-05	3.99E-01	2.48E-05	8.53E-06
G_BASE_CLAY_0														
50_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.65E-03	1.32E-04	1.65E-05	1.65E-05	3.89E-01	3.99E-06	1.37E-06
G_BASE_LOAM_														
050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	2.45E-04	1.21E-04	2.45E-06	2.45E-06	5.80E-02	3.66E-06	1.26E-06
G_BASE_SAND_1														
00_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	2.19E-03	8.11E-04	2.19E-05	2.19E-05	5.19E-01	2.46E-05	8.45E-06
G_BASE_CLAY_1														
00_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	5.18E-03	2.97E-04	5.18E-05	5.18E-05	1.23E+00	8.99E-06	3.09E-06
G_BASE_LOAM_														
100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	9.03E-04	2.91E-04	9.03E-06	9.03E-06	2.13E-01	8.82E-06	3.03E-06
G_BASE_SAND_1														
50_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	3.00E-03	8.32E-04	3.00E-05	3.00E-05	7.09E-01	2.52E-05	8.67E-06
G_BASE_CLAY_1														
50_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	7.28E-03	3.17E-04	7.28E-05	7.28E-05	1.72E+00	9.62E-06	3.31E-06
G_BASE_LOAM_1														
50_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	1.31E-03	3.22E-04	1.31E-05	1.31E-05	3.09E-01	9.75E-06	3.35E-06
													1.24E-01	

TABLE B-16 (Cont.)
Potential Risks to Aquatic Species from Surface Runoff to Pond

SURFACE RUNOFF - modeled in GLEAMS - TYPICAL APPLICATION RATE												Pond Concentrations (mg/L)				Risk Quotients ¹ - Acute			
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants				
G_BASE_SAND_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	2.94E-03	6.73E-04	2.94E-05	2.94E-05	6.95E-01	2.04E-05	7.01E-06	2.59E-01				
G_BASE_CLAY_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	7.24E-03	2.90E-04	7.24E-05	7.24E-05	1.71E+00	8.80E-06	3.02E-06	1.12E-01				
G_BASE_LOAM_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	1.36E-03	3.09E-04	1.36E-05	1.36E-05	3.22E-01	9.36E-06	3.22E-06	1.19E-01				
G_BASE_SAND_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	2.82E-03	5.26E-04	2.82E-05	2.82E-05	6.66E-01	1.59E-05	5.48E-06	2.02E-01				
G_BASE_CLAY_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	7.17E-03	2.68E-04	7.17E-05	7.17E-05	1.69E+00	8.11E-06	2.79E-06	1.03E-01				
G_BASE_LOAM_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	1.28E-03	2.88E-04	1.28E-05	1.28E-05	3.02E-01	8.74E-06	3.00E-06	1.11E-01				
G_ARV1_050_POND_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	9.69E-05	4.75E-05	9.69E-07	9.69E-07	2.29E-02	1.44E-06	4.95E-07	1.83E-02				
G_ARV2_050_POND_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	2.23E-04	1.46E-04	2.23E-06	2.23E-06	5.27E-02	4.44E-06	1.53E-06	5.63E-02				
G_ARV3_050_POND_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	2.23E-04	1.49E-04	2.23E-06	2.23E-06	5.27E-02	4.50E-06	1.55E-06	5.72E-02				
G_ERV1_050_POND_TYP	50	10	0.05	0.015	0.050	Weeds (78)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.73E-02	3.66E-06	1.26E-06	4.65E-02				
G_ERV2_050_POND_TYP	50	10	0.05	0.015	0.200	Weeds (78)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.75E-02	3.66E-06	1.26E-06	4.65E-02				
G_ERV3_050_POND_TYP	50	10	0.05	0.015	0.500	Weeds (78)	Loam	2.45E-04	1.21E-04	2.45E-06	2.45E-06	5.79E-02	3.66E-06	1.26E-06	4.65E-02				
G_RGV1_050_POND_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.75E-02	3.66E-06	1.26E-06	4.65E-02				
G_RGV2_050_POND_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.74E-02	3.66E-06	1.26E-06	4.65E-02				
G_RGV3_050_POND_TYP	50	10	0.05	0.150	0.401	Weeds (78)	Loam	2.42E-04	1.21E-04	2.42E-06	2.42E-06	5.73E-02	3.66E-06	1.26E-06	4.64E-02				
G_SLV1_050_POND_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	2.42E-04	1.21E-04	2.42E-06	2.42E-06	5.73E-02	3.66E-06	1.26E-06	4.64E-02				

TABLE B-16 (Cont)

Potential Risks to Aquatic Species from Surface Runoff to Pond

SURFACE RUNOFF - modeled in GLEAMS - TYPICAL APPLICATION RATE															
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients ¹ - Acute		Risk Quotients ¹ - Chronic			
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_SLV2_050_POND_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.73E-02	3.66E-06	1.26E-06	4.64E-02
G_SLV3_050_POND_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	2.44E-04	1.21E-04	2.44E-06	2.44E-06	5.77E-02	3.66E-06	1.26E-06	4.65E-02
G_STV1_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt-Loam	5.95E-04	9.62E-05	5.95E-06	5.95E-06	1.41E-01	2.92E-06	1.00E-06	3.70E-02
G_STV2_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt Clay-Loam	4.31E-04	6.98E-05	4.31E-06	4.31E-06	1.02E-01	2.12E-06	7.28E-07	2.69E-02
G_STV3_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.31E-03	1.99E-04	1.31E-05	1.31E-05	3.10E-01	6.02E-06	2.07E-06	7.64E-02
G_VGV1_050_POND_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.75E-02	3.66E-06	1.26E-06	4.65E-02
G_VGV2_050_POND_TYP	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	2.43E-04	1.21E-04	2.43E-06	2.43E-06	5.75E-02	3.66E-06	1.26E-06	4.65E-02
G_VGV3_050_POND_TYP	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	2.70E-04	1.54E-04	2.70E-06	2.70E-06	6.38E-02	4.67E-06	1.60E-06	5.93E-02
SURFACE RUNOFF - modeled in GLEAMS - MAXIMUM APPLICATION RATE															
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients ¹ - Acute		Risk Quotients ¹ - Chronic			
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_SAND_005_POND_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Sand	4.28E-04	7.60E-05	4.28E-06	4.28E-06	1.01E-01	2.30E-06	7.92E-07	2.92E-02
G_BASE_CLAY_010_POND_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Clay	1.43E-03	6.51E-05	1.43E-05	1.43E-05	3.38E-01	1.97E-06	6.78E-07	2.50E-02
G_BASE_LOAM_010_POND_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Loam	1.26E-05	1.07E-06	1.26E-07	1.26E-07	2.98E-03	3.26E-08	1.12E-08	4.13E-04

TABLE B-16 (Cont.)
Potential Risks to Aquatic Species from Surface Runoff to Pond

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
								SURFACE RUNOFF - modeled in GLEAMS - MAXIMUM APPLICATION RATE							
G_BASE_SAND_0															
25_POND_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Sand	8.44E-03	3.86E-03	8.44E-05	8.44E-05	2.00E+00	1.17E-04	4.02E-05	1.49E+00
G_BASE_CLAY_0															
25_POND_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Clay	3.08E-03	2.62E-04	3.08E-05	3.08E-05	7.28E-01	7.95E-06	2.73E-06	1.01E-01
G_BASE_LOAM_025_POND_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Loam	1.36E-04	5.60E-05	1.36E-06	1.36E-06	3.22E-02	1.70E-06	5.84E-07	2.16E-02
G_BASE_SAND_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Sand	1.03E-02	5.02E-03	1.03E-04	1.03E-04	2.45E+00	1.52E-04	5.23E-05	1.93E+00
G_BASE_CLAY_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.01E-02	8.07E-04	1.01E-04	1.01E-04	2.39E+00	2.44E-05	8.40E-06	3.10E-01
G_BASE_LOAM_050_POND_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.50E-03	7.40E-04	1.50E-05	1.50E-05	3.55E-01	2.24E-05	7.71E-06	2.85E-01
G_BASE_SAND_100_POND_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Sand	1.34E-02	4.97E-03	1.34E-04	1.34E-04	3.18E+00	1.51E-04	5.18E-05	1.91E+00
G_BASE_CLAY_100_POND_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Clay	3.18E-02	1.82E-03	3.18E-04	3.18E-04	7.51E+00	5.51E-05	1.89E-05	6.99E-01
G_BASE_LOAM_100_POND_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Loam	5.53E-03	1.78E-03	5.53E-05	5.53E-05	1.31E+00	5.41E-05	1.86E-05	6.86E-01
G_BASE_SAND_150_POND_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Sand	1.84E-02	5.10E-03	1.84E-04	1.84E-04	4.34E+00	1.55E-04	5.31E-05	1.96E+00
G_BASE_CLAY_150_POND_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Clay	4.46E-02	1.95E-03	4.46E-04	4.46E-04	1.06E+01	5.90E-05	2.03E-05	7.48E-01
G_BASE_LOAM_150_POND_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Loam	8.02E-03	1.97E-03	8.02E-05	8.02E-05	1.90E+00	5.98E-05	2.05E-05	7.59E-01
G_BASE_SAND_200_POND_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Sand	1.80E-02	4.12E-03	1.80E-04	1.80E-04	4.26E+00	1.25E-04	4.30E-05	1.59E+00
G_BASE_CLAY_200_POND_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Clay	4.43E-02	1.78E-03	4.43E-04	4.43E-04	1.05E+01	5.39E-05	1.85E-05	6.84E-01
G_BASE_LOAM_200_POND_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Loam	8.34E-03	1.89E-03	8.34E-05	8.34E-05	1.97E+00	5.74E-05	1.97E-05	7.28E-01
G_BASE_SAND_250_POND_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Sand	1.73E-02	3.22E-03	1.73E-04	1.73E-04	4.08E+00	9.76E-05	3.36E-05	1.24E+00
G_BASE_CLAY_250_POND_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Clay	4.39E-02	1.64E-03	4.39E-04	4.39E-04	1.04E+01	4.97E-05	1.71E-05	6.31E-01
G_BASE_LOAM_250_POND_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Loam	7.84E-03	1.77E-03	7.84E-05	7.84E-05	1.85E+00	5.36E-05	1.84E-05	6.80E-01
G_ARV1_050_POND_MAX	50	1	0.05	0.015	0.401	Weeds (78)	Loam	5.94E-04	2.91E-04	5.94E-06	5.94E-06	1.40E-01	8.82E-06	3.03E-06	1.12E-01

TABLE B-16 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Pond

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic				
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants		
B-24	G_ARV2_050_PO	ND_MAX	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.37E-03	8.98E-04	1.37E-05	1.37E-05	3.23E-01	2.72E-05	9.35E-06	3.45E-01
	G_ARV3_050_PO	ND_MAX	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.37E-03	9.11E-04	1.37E-05	1.37E-05	3.23E-01	2.76E-05	9.49E-06	3.50E-01
	G_ERV1_050_PO	ND_MAX	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.51E-01	2.24E-05	7.71E-06	2.85E-01
	G_ERV2_050_PO	ND_MAX	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.52E-01	2.24E-05	7.71E-06	2.85E-01
	G_ERV3_050_PO	ND_MAX	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.50E-03	7.40E-04	1.50E-05	1.50E-05	3.55E-01	2.24E-05	7.71E-06	2.85E-01
	G_RGV1_050_PO	ND_MAX	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.52E-01	2.24E-05	7.71E-06	2.85E-01
	G_RGV2_050_PO	ND_MAX	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.52E-01	2.24E-05	7.71E-06	2.85E-01
	G_RGV3_050_PO	ND_MAX	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.51E-01	2.24E-05	7.71E-06	2.85E-01
	G_SLV1_050_PON	D_MAX	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.51E-01	2.24E-05	7.71E-06	2.85E-01
	G_SLV2_050_PON	D_MAX	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.51E-01	2.24E-05	7.71E-06	2.85E-01
	G_SLV3_050_PON	D_MAX	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.50E-03	7.40E-04	1.50E-05	1.50E-05	3.54E-01	2.24E-05	7.71E-06	2.85E-01
	G_STV1_050_PON	D_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt-Loam	3.64E-03	5.90E-04	3.64E-05	3.64E-05	8.62E-01	1.79E-05	6.14E-06	2.27E-01
	G_STV2_050_PON	D_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt	2.64E-03	4.28E-04	2.64E-05	2.64E-05	6.24E-01	1.30E-05	4.46E-06	1.65E-01
	G_STV3_050_PON	D_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay-Loam	8.04E-03	1.22E-03	8.04E-05	8.04E-05	1.90E+00	3.69E-05	1.27E-05	4.68E-01
	G_VGV1_050_PO	ND_MAX	50	10	0.05	0.015	0.401	Shrubs (79) Rye Grass (54)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.52E-01	2.24E-05	7.71E-06	2.85E-01
	G_VGV2_050_PO	ND_MAX	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	1.49E-03	7.40E-04	1.49E-05	1.49E-05	3.52E-01	2.24E-05	7.71E-06	2.85E-01
	G_VGV3_050_PO	ND_MAX	50	10	0.05	0.015	0.401		Loam	1.65E-03	9.44E-04	1.65E-05	1.65E-05	3.91E-01	2.86E-05	9.84E-06	3.63E-01

¹Risk Quotient = Estimated Dose/Toxicity Reference Value²USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.

TABLE B-17
Potential Risks to Aquatic Species from Surface Runoff to Stream

GLEAMS ID	SURFACE RUNOFF - modeled in GLEAMS - TYPICAL APPLICATION RATE										Stream					
	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic			
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	
G_BASE_SAND_00																
5_STREAM_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
G_BASE_CLAY_00																
5_STREAM_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
G_BASE_LOAM_0																
05_STREAM_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
G_BASE_SAND_01																
0_STREAM_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	2.85E-06	4.10E-08	2.85E-08	2.85E-08	6.73E-04	1.24E-09	4.27E-10	1.58E-05	
G_BASE_CLAY_01																
0_STREAM_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	7.70E-06	6.35E-08	7.70E-08	7.70E-08	1.82E-03	1.92E-09	6.62E-10	2.44E-05	
G_BASE_LOAM_0																
10_STREAM_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	6.88E-08	5.64E-10	6.88E-10	6.88E-10	1.63E-05	1.71E-11	5.87E-12	2.17E-07	
G_BASE_SAND_02																
5_STREAM_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	1.25E-04	4.31E-06	1.25E-06	1.25E-06	2.96E-02	1.31E-07	4.49E-08	1.66E-03	
G_BASE_CLAY_02																
5_STREAM_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	1.66E-05	2.46E-07	1.66E-07	1.66E-07	3.93E-03	7.45E-09	2.56E-09	9.45E-05	
G_BASE_LOAM_0																
25_STREAM_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	1.99E-06	6.33E-08	1.99E-08	1.99E-08	4.70E-04	1.92E-09	6.60E-10	2.44E-05	
G_BASE_SAND_05																
0_STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	2.54E-04	1.13E-05	2.54E-06	2.54E-06	6.00E-02	3.41E-07	1.17E-07	4.33E-03	
G_BASE_CLAY_05																
0_STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	5.97E-05	1.31E-06	5.97E-07	5.97E-07	1.41E-02	3.98E-08	1.37E-08	5.05E-04	
G_BASE_LOAM_0																
50_STREAM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.51E-08	5.56E-04	
G_BASE_SAND_10																
0_STREAM_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	2.32E-04	1.63E-05	2.32E-06	2.32E-06	5.48E-02	4.94E-07	1.70E-07	6.27E-03	
G_BASE_CLAY_10																
0_STREAM_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.74E-04	4.58E-06	1.74E-06	1.74E-06	4.11E-02	1.39E-07	4.77E-08	1.76E-03	
G_BASE_LOAM_1																
00_STREAM_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	4.29E-05	5.65E-06	4.29E-07	4.29E-07	1.01E-02	1.71E-07	5.88E-08	2.17E-03	

TABLE B-17 (Cont.)
Potential Risks to Aquatic Species from Surface Runoff to Stream

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_SAND_15															
0_STREAM_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	3.96E-04	1.95E-05	3.96E-06	3.96E-06	9.36E-02	5.92E-07	2.04E-07	7.52E-03
G_BASE_CLAY_15															
0_STREAM_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	3.79E-04	7.11E-06	3.79E-06	3.79E-06	8.97E-02	2.15E-07	7.40E-08	2.73E-03
G_BASE_LOAM_1															
50_STREAM_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	9.34E-05	8.30E-06	9.34E-07	9.34E-07	2.21E-02	2.52E-07	8.65E-08	3.19E-03
G_BASE_SAND_20															
0_STREAM_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	4.72E-04	2.06E-05	4.72E-06	4.72E-06	1.11E-01	6.24E-07	2.15E-07	7.92E-03
G_BASE_CLAY_20															
0_STREAM_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	5.60E-04	8.75E-06	5.60E-06	5.60E-06	1.32E-01	2.65E-07	9.12E-08	3.37E-03
G_BASE_LOAM_2															
00_STREAM_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	1.25E-04	9.82E-06	1.25E-06	1.25E-06	2.95E-02	2.98E-07	1.02E-07	3.78E-03
G_BASE_SAND_25															
0_STREAM_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	5.51E-04	2.05E-05	5.51E-06	5.51E-06	1.30E-01	6.22E-07	2.14E-07	7.89E-03
G_BASE_CLAY_25															
0_STREAM_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	7.14E-04	9.79E-06	7.14E-06	7.14E-06	1.69E-01	2.97E-07	1.02E-07	3.77E-03
G_BASE_LOAM_2															
50_STREAM_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	1.40E-04	1.06E-05	1.40E-06	1.40E-06	3.30E-02	3.23E-07	1.11E-07	4.10E-03
G_ARV1_050_STR															
EAM_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	2.72E-06	1.62E-07	2.72E-08	2.72E-08	6.42E-04	4.92E-09	1.69E-09	6.25E-05
G_ARV2_050_STR															
EAM_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	6.81E-05	8.42E-06	6.81E-07	6.81E-07	1.61E-02	2.55E-07	8.77E-08	3.24E-03
G_ARV3_050_STR															
EAM_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.60E-04	2.25E-05	1.60E-06	1.60E-06	3.79E-02	6.80E-07	2.34E-07	8.63E-03
G_ERV1_050_STR															
EAM_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.37E-08	1.50E-08	5.55E-04
G_ERV2_050_STR															
EAM_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.50E-08	5.55E-04
G_ERV3_050_STR															
EAM_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.50E-08	5.56E-04
G_RGV1_050_STR															
EAM_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.50E-08	5.55E-04
G_RGV2_050_STR															
EAM_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.37E-08	1.50E-08	5.55E-04
G_RGV3_050_STR															
EAM_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.37E-08	1.50E-08	5.55E-04
G_SLV1_050_STRE															
AM_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.37E-08	1.50E-08	5.55E-04

TABLE B-17 (Cont.)

Potential Risks to Aquatic Species from Surface Runoff to Stream

SURFACE RUNOFF - modeled in GLEAMS TYPICAL APPLICATION RATE															
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_SLV2_050_STRE															
AM_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.37E-08	1.50E-08	5.55E-04
G_SLV3_050_STRE															
AM_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.50E-08	5.55E-04
G_STV1_050_STRE															
AM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt-Loam	2.01E-05	8.19E-07	2.01E-07	2.01E-07	4.75E-03	2.48E-08	8.53E-09	3.15E-04
G_STV2_050_STRE															
AM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt	2.08E-05	6.89E-07	2.08E-07	2.08E-07	4.91E-03	2.09E-08	7.18E-09	2.65E-04
G_STV3_050_STRE															
AM_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay-Loam	4.93E-05	1.46E-06	4.93E-07	4.93E-07	1.17E-02	4.43E-08	1.52E-08	5.63E-04
G_VGV1_050_STR						Shrubs (79)									
EAM_TYP	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.50E-08	5.55E-04
G_VGV2_050_STR															
EAM_TYP	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	1.92E-05	1.44E-06	1.92E-07	1.92E-07	4.54E-03	4.38E-08	1.50E-08	5.55E-04
G_VGV3_050_STR															
EAM_TYP	50	10	0.05	0.015	0.401			2.28E-05	1.97E-06	2.28E-07	2.28E-07	5.40E-03	5.96E-08	2.05E-08	7.57E-04
SURFACE RUNOFF - modeled in GLEAMS - MAXIMUM APPLICATION RATE															
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_SAND_00															
5_STREAM_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_00															
5_STREAM_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_0															
05_STREAM_MAX	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_01															
0_STREAM_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Sand	1.74E-05	2.51E-07	1.74E-07	1.74E-07	4.12E-03	7.62E-09	2.62E-09	9.67E-05
G_BASE_CLAY_01															
0_STREAM_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Clay	4.72E-05	3.89E-07	4.72E-07	4.72E-07	1.12E-02	1.18E-08	4.06E-09	1.50E-04

TABLE B-17 (Cont.)
Potential Risks to Aquatic Species from Surface Runoff to Stream

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_BASE_LOAM_0															
10_STREAM_MAX	10	10	0.05	0.015	0.401	Weeds (78)	Loam	4.22E-07	3.46E-09	4.22E-09	4.22E-09	9.97E-05	1.05E-10	3.60E-11	1.33E-06
G_BASE_SAND_02															
5_STREAM_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Sand	7.67E-04	2.64E-05	7.67E-06	7.67E-06	1.81E-01	8.01E-07	2.75E-07	1.02E-02
G_BASE_CLAY_02															
5_STREAM_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Clay	1.02E-04	1.51E-06	1.02E-06	1.02E-06	2.41E-02	4.56E-08	1.57E-08	5.79E-04
G_BASE_LOAM_0															
25_STREAM_MAX	25	10	0.05	0.015	0.401	Weeds (78)	Loam	1.22E-05	3.88E-07	1.22E-07	1.22E-07	2.88E-03	1.18E-08	4.04E-09	1.49E-04
G_BASE_SAND_05															
0_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Sand	1.56E-03	6.91E-05	1.56E-05	1.56E-05	3.68E-01	2.09E-06	7.19E-07	2.66E-02
G_BASE_CLAY_05															
0_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Clay	3.66E-04	8.04E-06	3.66E-06	3.66E-06	8.65E-02	2.44E-07	8.38E-08	3.09E-03
G_BASE_LOAM_0															
50_STREAM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.18E-04	8.86E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.41E-03
G_BASE_SAND_10															
0_STREAM_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Sand	1.42E-03	9.99E-05	1.42E-05	1.42E-05	3.36E-01	3.03E-06	1.04E-06	3.84E-02
G_BASE_CLAY_10															
0_STREAM_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.07E-03	2.80E-05	1.07E-05	1.07E-05	2.52E-01	8.50E-07	2.92E-07	1.08E-02
G_BASE_LOAM_1															
00_STREAM_MAX	100	10	0.05	0.015	0.401	Weeds (78)	Loam	2.63E-04	3.46E-05	2.63E-06	2.63E-06	6.21E-02	1.05E-06	3.61E-07	1.33E-02
G_BASE_SAND_15															
0_STREAM_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Sand	2.43E-03	1.20E-04	2.43E-05	2.43E-05	5.74E-01	3.63E-06	1.25E-06	4.61E-02
G_BASE_CLAY_15															
0_STREAM_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Clay	2.33E-03	4.36E-05	2.33E-05	2.33E-05	5.50E-01	1.32E-06	4.54E-07	1.68E-02
G_BASE_LOAM_1															
50_STREAM_MAX	150	10	0.05	0.015	0.401	Weeds (78)	Loam	5.72E-04	5.09E-05	5.72E-06	5.72E-06	1.35E-01	1.54E-06	5.30E-07	1.96E-02
G_BASE_SAND_20															
0_STREAM_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Sand	2.89E-03	1.26E-04	2.89E-05	2.89E-05	6.83E-01	3.82E-06	1.31E-06	4.85E-02
G_BASE_CLAY_20															
0_STREAM_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Clay	3.43E-03	5.36E-05	3.43E-05	3.43E-05	8.11E-01	1.63E-06	5.59E-07	2.06E-02
G_BASE_LOAM_2															
00_STREAM_MAX	200	10	0.05	0.015	0.401	Weeds (78)	Loam	7.64E-04	6.02E-05	7.64E-06	7.64E-06	1.81E-01	1.82E-06	6.27E-07	2.31E-02
G_BASE_SAND_25															
0_STREAM_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Sand	3.38E-03	1.26E-04	3.38E-05	3.38E-05	7.98E-01	3.81E-06	1.31E-06	4.84E-02
G_BASE_CLAY_25															
0_STREAM_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Clay	4.38E-03	6.00E-05	4.38E-05	4.38E-05	1.03E+00	1.82E-06	6.25E-07	2.31E-02
G_BASE_LOAM_2															
50_STREAM_MAX	250	10	0.05	0.015	0.401	Weeds (78)	Loam	8.56E-04	6.53E-05	8.56E-06	8.56E-06	2.02E-01	1.98E-06	6.80E-07	2.51E-02

TABLE B-17 (Cont.)
Potential Risks to Aquatic Species from Surface Runoff to Stream

GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ² Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Stream Concentrations (mg/L)		Risk Quotients ¹ - Acute			Risk Quotients ¹ - Chronic		
								Acute Exposure Scenarios	Chronic Exposure Scenarios	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants	Fish	Aquatic Invertebrates	Non-Target Aquatic Plants
G_ARV1_050_STR															
EAM_MAX	50	1	0.05	0.015	0.401	Weeds (78)	Loam	1.66E-05	9.95E-07	1.66E-07	1.66E-07	3.94E-03	3.02E-08	1.04E-08	3.83E-04
G_ARV2_050_STR															
EAM_MAX	50	100	0.05	0.015	0.401	Weeds (78)	Loam	4.18E-04	5.16E-05	4.18E-06	4.18E-06	9.87E-02	1.56E-06	5.37E-07	1.98E-02
G_ARV3_050_STR															
EAM_MAX	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	9.83E-04	1.38E-04	9.83E-06	9.83E-06	2.32E-01	4.17E-06	1.43E-06	5.29E-02
G_ERV1_050_STR															
EAM_MAX	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_ERV2_050_STR															
EAM_MAX	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_ERV3_050_STR															
EAM_MAX	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.41E-03
G_RGV1_050_STR															
EAM_MAX	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_RGV2_050_STR															
EAM_MAX	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_RGV3_050_STR															
EAM_MAX	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_SLV1_050_STRE															
AM_MAX	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_SLV2_050_STRE															
AM_MAX	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_SLV3_050_STRE															
AM_MAX	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_STV1_050_STRE															
AM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.23E-04	5.02E-06	1.23E-06	1.23E-06	2.91E-02	1.52E-07	5.23E-08	1.93E-03
G_STV2_050_STRE															
AM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Silt Clay	1.27E-04	4.23E-06	1.27E-06	1.27E-06	3.01E-02	1.28E-07	4.40E-08	1.63E-03
G_STV3_050_STRE															
AM_MAX	50	10	0.05	0.015	0.401	Weeds (78)	Loam	3.02E-04	8.97E-06	3.02E-06	3.02E-06	7.14E-02	2.72E-07	9.34E-08	3.45E-03
G_VGV1_050_STR															
EAM_MAX	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_VGV2_050_STR															
EAM_MAX	50	10	0.05	0.015	0.401	(54) Conifer	Loam	1.18E-04	8.85E-06	1.18E-06	1.18E-06	2.78E-02	2.68E-07	9.22E-08	3.40E-03
G_VGV3_050_STR															
EAM_MAX	50	10	0.05	0.015	0.401	+Hardwood	Loam	1.40E-04	1.21E-05	1.40E-06	1.40E-06	3.31E-02	3.65E-07	1.26E-07	4.64E-03
						(71)									

¹RQ = Risk Quotient = Estimated Dose/Toxicity Reference Value.

²USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.

TABLE B-18
Potential Risks to Non-Target Terrestrial Plants from Surface Runoff

SURFACE RUNOFF - modeled in GLEAMS TYPICAL APPLICATION RATE										
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ¹ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Terrestrial Concentration (lb/acre)	Typical Species RQ ²	Rare, Threatened, and Endangered Species RQ
G_BASE_SAND_005_TERR_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_TERR_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_TERR_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_TERR_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_010_TERR_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	7.77E-06	1.21E-04	2.43E-04
G_BASE_LOAM_010_TERR_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	7.14E-08	1.12E-06	2.23E-06
G_BASE_SAND_025_TERR_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	3.95E-12	6.18E-11	1.24E-10
G_BASE_CLAY_025_TERR_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	1.65E-05	2.57E-04	5.15E-04
G_BASE_LOAM_025_TERR_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	4.68E-07	7.32E-06	1.46E-05
G_BASE_SAND_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	6.66E-05	1.04E-03	2.08E-03
G_BASE_LOAM_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	3.64E-06	5.68E-05	1.14E-04
G_BASE_SAND_100_TERR_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	9.88E-11	1.54E-09	3.09E-09
G_BASE_CLAY_100_TERR_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.82E-04	2.84E-03	5.68E-03
G_BASE_LOAM_100_TERR_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	2.85E-05	4.46E-04	8.92E-04
G_BASE_SAND_150_TERR_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	3.95E-12	6.18E-11	1.24E-10
G_BASE_CLAY_150_TERR_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	4.31E-04	6.74E-03	1.35E-02
G_BASE_LOAM_150_TERR_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	8.26E-05	1.29E-03	2.58E-03
G_BASE_SAND_200_TERR_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	6.21E-09	9.71E-08	1.94E-07
G_BASE_CLAY_200_TERR_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	6.90E-04	1.08E-02	2.15E-02
G_BASE_LOAM_200_TERR_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	1.27E-04	1.98E-03	3.97E-03
G_BASE_SAND_250_TERR_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	5.22E-09	8.15E-08	1.63E-07
G_BASE_CLAY_250_TERR_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	9.50E-04	1.48E-02	2.97E-02
G_BASE_LOAM_250_TERR_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	1.61E-04	2.51E-03	5.02E-03

TABLE B-18 (Cont.)
Potential Risks to Non-Target Terrestrial Plants from Surface Runoff

GLEAMS ID	SURFACE RUNOFF - modeled in GLEAMS - TYPICAL APPLICATION RATE										Rare, Threatened, and Endangered Species RQ ²
	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ¹ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Terrestrial Concentration (lb/acre)	Typical Species RQ ²		
G_ARV1_050_TERR_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	3.50E-06	5.47E-05	1.09E-04	
G_ARV2_050_TERR_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	3.50E-06	5.47E-05	1.09E-04	
G_ARV3_050_TERR_TYP	50	1000	0.05	0.015	0.401	Weeds (78)	Loam	3.49E-06	5.46E-05	1.09E-04	
G_ERV1_050_TERR_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	3.47E-06	5.43E-05	1.09E-04	
G_ERV2_050_TERR_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	3.52E-06	5.50E-05	1.10E-04	
G_ERV3_050_TERR_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	3.61E-06	5.64E-05	1.13E-04	
G_RGV1_050_TERR_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	3.50E-06	5.48E-05	1.10E-04	
G_RGV2_050_TERR_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	3.50E-06	5.46E-05	1.09E-04	
G_RGV3_050_TERR_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	3.47E-06	5.42E-05	1.08E-04	
G_SLV1_050_TERR_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	3.47E-06	5.42E-05	1.08E-04	
G_SLV2_050_TERR_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	3.47E-06	5.42E-05	1.08E-04	
G_SLV3_050_TERR_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	3.57E-06	5.58E-05	1.12E-04	
G_STV1_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt-Loam	2.03E-05	3.17E-04	6.34E-04	
G_STV2_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt-Clay-Loam	2.13E-05	3.33E-04	6.66E-04	
G_STV3_050_TERR_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay-Loam	5.74E-05	8.96E-04	1.79E-03	
G_VGV1_050_TERR_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	3.50E-06	5.48E-05	1.10E-04	
G_VGV2_050_TERR_TYP	50	10	0.05	0.015	0.401	Rye Grass (54) Conifer + Hardwood (71)	Loam	3.50E-06	5.48E-05	1.10E-04	
G_VGV3_050_TERR_TYP	50	10	0.05	0.015	0.401		Loam	3.88E-06	6.06E-05	1.21E-04	

TABLE B-18 (Cont.)
Potential Risks to Non-Target Terrestrial Plants from Surface Runoff

GLEAMS ID	SURFACE RUNOFF - modeled in GLEAMS - MAXIMUM APPLICATION RATE										Rare, Threatened, and Endangered Species RQ
	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ¹ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Terrestrial Concentration (lb/acre)	Typical Species RQ ²		
G_BASE_SAND_005_TERR_max	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	
G_BASE_CLAY_005_TERR_max	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	
G_BASE_LOAM_005_TERR_max	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	
G_BASE_SAND_010_TERR_max	10	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	
G_BASE_CLAY_010_TERR_max	10	10	0.05	0.015	0.401	Weeds (78)	Clay	4.76E-05	7.44E-04	1.49E-03	
G_BASE_LOAM_010_TERR_max	10	10	0.05	0.015	0.401	Weeds (78)	Loam	4.38E-07	6.84E-06	1.37E-05	
G_BASE_SAND_025_TERR_max	25	10	0.05	0.015	0.401	Weeds (78)	Sand	2.42E-11	3.78E-10	7.57E-10	
G_BASE_CLAY_025_TERR_max	25	10	0.05	0.015	0.401	Weeds (78)	Clay	1.01E-04	1.58E-03	3.15E-03	
G_BASE_LOAM_025_TERR_max	25	10	0.05	0.015	0.401	Weeds (78)	Loam	2.87E-06	4.48E-05	8.97E-05	
G_BASE_SAND_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	
G_BASE_CLAY_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay	4.08E-04	6.38E-03	1.28E-02	
G_BASE_LOAM_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Loam	2.23E-05	3.48E-04	6.97E-04	
G_BASE_SAND_100_TERR_max	100	10	0.05	0.015	0.401	Weeds (78)	Sand	6.05E-10	9.46E-09	1.89E-08	
G_BASE_CLAY_100_TERR_max	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.11E-03	1.74E-02	3.48E-02	
G_BASE_LOAM_100_TERR_max	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.75E-04	2.73E-03	5.47E-03	
G_BASE_SAND_150_TERR_max	150	10	0.05	0.015	0.401	Weeds (78)	Sand	2.42E-11	3.78E-10	7.57E-10	
G_BASE_CLAY_150_TERR_max	150	10	0.05	0.015	0.401	Weeds (78)	Clay	2.64E-03	4.13E-02	8.26E-02	
G_BASE_LOAM_150_TERR_max	150	10	0.05	0.015	0.401	Weeds (78)	Loam	5.06E-04	7.91E-03	1.58E-02	
G_BASE_SAND_200_TERR_max	200	10	0.05	0.015	0.401	Weeds (78)	Sand	3.81E-08	5.95E-07	1.19E-06	
G_BASE_CLAY_200_TERR_max	200	10	0.05	0.015	0.401	Weeds (78)	Clay	4.23E-03	6.60E-02	1.32E-01	
G_BASE_LOAM_200_TERR_max	200	10	0.05	0.015	0.401	Weeds (78)	Loam	7.78E-04	1.22E-02	2.43E-02	
G_BASE_SAND_250_TERR_max	250	10	0.05	0.015	0.401	Weeds (78)	Sand	3.20E-08	5.00E-07	1.00E-06	
G_BASE_CLAY_250_TERR_max	250	10	0.05	0.015	0.401	Weeds (78)	Clay	5.82E-03	9.10E-02	1.82E-01	
G_BASE_LOAM_250_TERR_max	250	10	0.05	0.015	0.401	Weeds (78)	Loam	9.84E-04	1.54E-02	3.08E-02	
G_ARV1_050_TERR_max	50	1	0.05	0.015	0.401	Weeds (78)	Loam	2.14E-05	3.35E-04	6.70E-04	

TABLE B-18 (Cont.)

Potential Risks to Non-Target Terrestrial Plants from Surface Runoff

GLEAMS ID	SURFACE RUNOFF - modeled in GLEAMS - MAXIMUM APPLICATION RATE									
	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ¹ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Terrestrial Concentration (lb/acre)	Typical Species RQ ²	Rare, Threatened, and Endangered Species RQ
G_ARV2_050_TERR_max	50	100	0.05	0.015	0.401	Weeds (78)	Loam	2.15E-05	3.35E-04	6.71E-04
G_ARV3_050_TERR_max	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	2.14E-05	3.35E-04	6.69E-04
G_ERV1_050_TERR_max	50	10	0.05	0.015	0.05	Weeds (78)	Loam	2.13E-05	3.33E-04	6.65E-04
G_ERV2_050_TERR_max	50	10	0.05	0.015	0.2	Weeds (78)	Loam	2.16E-05	3.37E-04	6.74E-04
G_ERV3_050_TERR_max	50	10	0.05	0.015	0.5	Weeds (78)	Loam	2.21E-05	3.45E-04	6.91E-04
G_RGV1_050_TERR_max	50	10	0.05	0.023	0.401	Weeds (78)	Loam	2.15E-05	3.36E-04	6.71E-04
G_RGV2_050_TERR_max	50	10	0.05	0.046	0.401	Weeds (78)	Loam	2.14E-05	3.35E-04	6.70E-04
G_RGV3_050_TERR_max	50	10	0.05	0.15	0.401	Weeds (78)	Loam	2.13E-05	3.32E-04	6.64E-04
G_SLV1_050_TERR_max	50	10	0.005	0.015	0.401	Weeds (78)	Loam	2.13E-05	3.32E-04	6.64E-04
G_SLV2_050_TERR_max	50	10	0.01	0.015	0.401	Weeds (78)	Loam	2.13E-05	3.32E-04	6.65E-04
G_SLV3_050_TERR_max	50	10	0.1	0.015	0.401	Weeds (78)	Loam	2.19E-05	3.42E-04	6.84E-04
G_STV1_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt-Loam	1.24E-04	1.94E-03	3.88E-03
G_STV2_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt	1.31E-04	2.04E-03	4.08E-03
G_STV3_050_TERR_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay-Loam	3.52E-04	5.49E-03	1.10E-02
G_VGV1_050_TERR_max	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	2.15E-05	3.36E-04	6.71E-04
G_VGV2_050_TERR_max	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	2.15E-05	3.36E-04	6.71E-04
G_VGV3_050_TERR_max	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	2.38E-05	3.71E-04	7.43E-04

¹USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.²RQ = Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-19

**Potential Risk to Predatory Bird from Long-Term Consumption of Contaminated Fish from Pond
(Pond Impacted by Surface Runoff Modeled in GLEAMS)**

Parameters/ Assumptions	Value	Units
Body weight (BW)	5.15	kg
Food ingestion rate (dry weight [dw])¹	0.1018	kg dw/day
Food ingestion rate (wet weight [ww]) (ir)²	0.4071	kg ww/day
Bioconcentration factor (BCF)	0.11	L/kg fish
Proportion of diet contaminated (pc)	1	unitless
Toxicity reference value (TRV)³	65	mg/kg-bw/day

TYPICAL APPLICATION RATE											
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ⁴ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (C _{pond} mg/L)	Concentrations in fish (C _{Fish}): C _{pond} × BCF	Dose estimates (D): (C _{Fish} × ir × pc) / BW	Risk Quotient ⁵
G_BASE_SAND_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_TYP	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Sand	1.24E-05	1.36E-06	1.08E-07	1.66E-09
G_BASE_CLAY_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Clay	1.06E-05	1.17E-06	9.23E-08	1.42E-09
G_BASE_LOAM_010_POND_TYP	10	10	0.05	0.015	0.401	Weeds (78)	Loam	1.75E-07	1.93E-08	1.52E-09	2.35E-11
G_BASE_SAND_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Sand	6.30E-04	6.93E-05	5.48E-06	8.43E-08
G_BASE_CLAY_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Clay	4.28E-05	4.71E-06	3.72E-07	5.73E-09
G_BASE_LOAM_025_POND_TYP	25	10	0.05	0.015	0.401	Weeds (78)	Loam	9.14E-06	1.01E-06	7.95E-08	1.22E-09
G_BASE_SAND_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Sand	8.18E-04	9.00E-05	7.12E-06	1.09E-07
G_BASE_CLAY_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay	1.32E-04	1.45E-05	1.14E-06	1.76E-08
G_BASE_LOAM_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08

TABLE B-19 (Cont.)

**Potential Risk to Predatory Bird from Long-Term Consumption of Contaminated Fish from Pond
(Pond Impacted by Surface Runoff Modeled in GLEAMS)**

TYPICAL APPLICATION RATE												
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ⁴ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (C _{pond} mg/L)	Concentrations in fish (C _{Fish}): C _{pond} × BCF	Dose estimates (D): (C _{Fish} × ir × pc) / BW	Risk Quotient ⁵	
G_BASE_SAND_100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Sand	8.11E-04	8.92E-05	7.05E-06	1.08E-07	
G_BASE_CLAY_100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Clay	2.97E-04	3.26E-05	2.58E-06	3.97E-08	
G_BASE_LOAM_100_POND_TYP	100	10	0.05	0.015	0.401	Weeds (78)	Loam	2.91E-04	3.20E-05	2.53E-06	3.89E-08	
G_BASE_SAND_150_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Sand	8.32E-04	9.16E-05	7.24E-06	1.11E-07	
G_BASE_CLAY_150_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Clay	3.17E-04	3.49E-05	2.76E-06	4.25E-08	
G_BASE_LOAM_150_POND_TYP	150	10	0.05	0.015	0.401	Weeds (78)	Loam	3.22E-04	3.54E-05	2.80E-06	4.31E-08	
G_BASE_SAND_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Sand	6.73E-04	7.40E-05	5.85E-06	9.00E-08	
G_BASE_CLAY_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Clay	2.90E-04	3.19E-05	2.52E-06	3.88E-08	
G_BASE_LOAM_200_POND_TYP	200	10	0.05	0.015	0.401	Weeds (78)	Loam	3.09E-04	3.40E-05	2.69E-06	4.13E-08	
G_BASE_SAND_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Sand	5.26E-04	5.78E-05	4.57E-06	7.03E-08	
G_BASE_CLAY_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Clay	2.68E-04	2.95E-05	2.33E-06	3.58E-08	
G_BASE_LOAM_250_POND_TYP	250	10	0.05	0.015	0.401	Weeds (78)	Loam	2.88E-04	3.17E-05	2.51E-06	3.86E-08	
G_ARV1_050_POND_TYP	50	1	0.05	0.015	0.401	Weeds (78)	Loam	4.75E-05	5.22E-06	4.13E-07	6.35E-09	
G_ARV2_050_POND_TYP	50	100	0.05	0.015	0.401	Weeds (78)	Loam	1.46E-04	1.61E-05	1.27E-06	1.96E-08	
G_ARV3_050_POND_TYP	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	1.49E-04	1.64E-05	1.29E-06	1.99E-08	
G_ERV1_050_POND_TYP	50	10	0.05	0.015	0.05	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_ERV2_050_POND_TYP	50	10	0.05	0.015	0.2	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_ERV3_050_POND_TYP	50	10	0.05	0.015	0.5	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_RGV1_050_POND_TYP	50	10	0.05	0.023	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_RGV2_050_POND_TYP	50	10	0.05	0.046	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_RGV3_050_POND_TYP	50	10	0.05	0.15	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_SLV1_050_POND_TYP	50	10	0.005	0.015	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_SLV2_050_POND_TYP	50	10	0.01	0.015	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_SLV3_050_POND_TYP	50	10	0.1	0.015	0.401	Weeds (78)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08	
G_STV1_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	9.62E-05	1.06E-05	8.37E-07	1.29E-08	

TABLE B-19 (Cont.)
Potential Risk to Predatory Bird from Long-Term Consumption of Contaminated Fish from Pond
(Pond Impacted by Surface Runoff Modeled in GLEAMS)

TYPICAL APPLICATION RATE											
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ⁴ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (C _{pond} mg/L)	Concentrations in fish (C _{Fish}): C _{pond} × BCF	Dose estimates (D): (C _{Fish} × ir × pc) / BW	Risk Quotient ⁵
G_STV2_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Silt	6.98E-05	7.68E-06	6.07E-07	9.34E-09
G_STV3_050_POND_TYP	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	1.99E-04	2.18E-05	1.73E-06	2.66E-08
G_VGV1_050_POND_TYP	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08
G_VGV2_050_POND_TYP	50	10	0.05	0.015	0.401	Rye Grass (54) Conifer + Hardwood (71)	Loam	1.21E-04	1.33E-05	1.05E-06	1.62E-08
G_VGV3_050_POND_TYP	50	10	0.05	0.015	0.401		Loam	1.54E-04	1.69E-05	1.34E-06	2.06E-08
MAXIMUM APPLICATION RATE											
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ⁴ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (mg/L)	Concentrations in fish (C _{Fish}): WC × BCF	Dose estimates (D): C _{Fish} × A × Prop / W	Risk Quotient ⁵
G_BASE_SAND_005_POND_max	5	10	0.05	0.015	0.401	Weeds (78)	Sand	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_CLAY_005_POND_max	5	10	0.05	0.015	0.401	Weeds (78)	Clay	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_LOAM_005_POND_max	5	10	0.05	0.015	0.401	Weeds (78)	Loam	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G_BASE_SAND_010_POND_max	10	10	0.05	0.015	0.401	Weeds (78)	Sand	7.60E-05	8.36E-06	6.61E-07	1.02E-08
G_BASE_CLAY_010_POND_max	10	10	0.05	0.015	0.401	Weeds (78)	Clay	6.51E-05	7.16E-06	5.66E-07	8.70E-09
G_BASE_LOAM_010_POND_max	10	10	0.05	0.015	0.401	Weeds (78)	Loam	1.07E-06	1.18E-07	9.35E-09	1.44E-10
G_BASE_SAND_025_POND_max	25	10	0.05	0.015	0.401	Weeds (78)	Sand	3.86E-03	4.25E-04	3.36E-05	5.17E-07
G_BASE_CLAY_025_POND_max	25	10	0.05	0.015	0.401	Weeds (78)	Clay	2.62E-04	2.89E-05	2.28E-06	3.51E-08
G_BASE_LOAM_025_POND_max	25	10	0.05	0.015	0.401	Weeds (78)	Loam	5.60E-05	6.16E-06	4.87E-07	7.50E-09
G_BASE_SAND_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Sand	5.02E-03	5.52E-04	4.36E-05	6.71E-07
G_BASE_CLAY_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay	8.07E-04	8.87E-05	7.01E-06	1.08E-07
G_BASE_LOAM_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.91E-08
G_BASE_SAND_100_POND_max	100	10	0.05	0.015	0.401	Weeds (78)	Sand	4.97E-03	5.47E-04	4.32E-05	6.65E-07
G_BASE_CLAY_100_POND_max	100	10	0.05	0.015	0.401	Weeds (78)	Clay	1.82E-03	2.00E-04	1.58E-05	2.43E-07
G_BASE_LOAM_100_POND_max	100	10	0.05	0.015	0.401	Weeds (78)	Loam	1.78E-03	1.96E-04	1.55E-05	2.39E-07

TABLE B-19 (Cont.)

**Potential Risk to Predatory Bird from Long-Term Consumption of Contaminated Fish from Pond
(Pond Impacted by Surface Runoff Modeled in GLEAMS)**

MAXIMUM APPLICATION RATE											
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ⁴ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (mg/L)	Concentrations in fish (C _{Fish}): WC × BCF	Dose estimates (D): C _{Fish} × A × Prop / W	Risk Quotient ⁵
G_BASE_SAND_150_POND_max	150	10	0.05	0.015	0.401	Weeds (78)	Sand	5.10E-03	5.61E-04	4.44E-05	6.83E-07
G_BASE_CLAY_150_POND_max	150	10	0.05	0.015	0.401	Weeds (78)	Clay	1.95E-03	2.14E-04	1.69E-05	2.60E-07
G_BASE_LOAM_150_POND_max	150	10	0.05	0.015	0.401	Weeds (78)	Loam	1.97E-03	2.17E-04	1.72E-05	2.64E-07
G_BASE_SAND_200_POND_max	200	10	0.05	0.015	0.401	Weeds (78)	Sand	4.12E-03	4.54E-04	3.59E-05	5.52E-07
G_BASE_CLAY_200_POND_max	200	10	0.05	0.015	0.401	Weeds (78)	Clay	1.78E-03	1.96E-04	1.55E-05	2.38E-07
G_BASE_LOAM_200_POND_max	200	10	0.05	0.015	0.401	Weeds (78)	Loam	1.89E-03	2.08E-04	1.65E-05	2.53E-07
G_BASE_SAND_250_POND_max	250	10	0.05	0.015	0.401	Weeds (78)	Sand	3.22E-03	3.54E-04	2.80E-05	4.31E-07
G_BASE_CLAY_250_POND_max	250	10	0.05	0.015	0.401	Weeds (78)	Clay	1.64E-03	1.81E-04	1.43E-05	2.20E-07
G_BASE_LOAM_250_POND_max	250	10	0.05	0.015	0.401	Weeds (78)	Loam	1.77E-03	1.94E-04	1.54E-05	2.36E-07
G_ARV1_050_POND_max	50	1	0.05	0.015	0.401	Weeds (78)	Loam	2.91E-04	3.20E-05	2.53E-06	3.89E-08
G_ARV2_050_POND_max	50	100	0.05	0.015	0.401	Weeds (78)	Loam	8.98E-04	9.88E-05	7.81E-06	1.20E-07
G_ARV3_050_POND_max	50	1,000	0.05	0.015	0.401	Weeds (78)	Loam	9.11E-04	1.00E-04	7.92E-06	1.22E-07
G_ERV1_050_POND_max	50	10	0.05	0.015	0.05	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_ERV2_050_POND_max	50	10	0.05	0.015	0.2	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_ERV3_050_POND_max	50	10	0.05	0.015	0.5	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.91E-08
G_RGV1_050_POND_max	50	10	0.05	0.023	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_RGV2_050_POND_max	50	10	0.05	0.046	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_RGV3_050_POND_max	50	10	0.05	0.15	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_SLV1_050_POND_max	50	10	0.005	0.015	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_SLV2_050_POND_max	50	10	0.01	0.015	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_SLV3_050_POND_max	50	10	0.1	0.015	0.401	Weeds (78)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_STV1_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt Loam	5.90E-04	6.49E-05	5.13E-06	7.89E-08
G_STV2_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Silt	4.28E-04	4.71E-05	3.72E-06	5.73E-08

TABLE B-19 (Cont.)

**Potential Risk to Predatory Bird from Long-Term Consumption of Contaminated Fish from Pond
(Pond Impacted by Surface Runoff Modeled in GLEAMS)**

MAXIMUM APPLICATION RATE											
GLEAMS ID	Annual Precipitation (inches)	Application Area (acres)	Hydraulic Slope (ft/ft)	Surface Roughness	USLE ⁴ Soil Erodibility Factor (ton/ac per EI)	Vegetation Type	Soil Type	Pond Concentration (mg/L)	Concentrations in fish (C _{Fish}): WC × BCF	Dose estimates (D): C _{Fish} × A × Prop / W	Risk Quotient ⁵
G_STV3_050_POND_max	50	10	0.05	0.015	0.401	Weeds (78)	Clay Loam	1.22E-03	1.34E-04	1.06E-05	1.63E-07
G_VGV1_050_POND_max	50	10	0.05	0.015	0.401	Shrubs (79)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_VGV2_050_POND_max	50	10	0.05	0.015	0.401	Rye Grass (54)	Loam	7.40E-04	8.14E-05	6.44E-06	9.90E-08
G_VGV3_050_POND_max	50	10	0.05	0.015	0.401	Conifer + Hardwood (71)	Loam	9.44E-04	1.04E-04	8.21E-06	1.26E-07

¹Calculated using algorithm developed by Nagy (1987) for all birds; where food ingestion rate (kg dw/day) = 0.0582×(BW)^{0.651}.

²Assumes fish are 75% water (USEPA 1993; Table 4-1 - value for bony fishes).

³Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

⁴USLE = Universal Soil Loss Equation, which predicts soil loss as a function of soil erodibility, topography, rainfall/runoff, cover, and support management factors.

⁵Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-20
**Potential Risks to Non-Target Terrestrial Plants from Herbicide in
Dust Deposited from Wind Erosion**

WIND EROSION - modeled in CALPUFF TYPICAL APPLICATION RATE							
Cal Puff Scenario ID	Watershed Location	Distance From Receptor (km)	Terrestrial Concentration (lb/acre)	Typical Species		Rare, Threatened, and Endangered Species	
				TRV ¹	RQ ²	TRV ¹	RQ ²
dust_MT_0.5_typ	MT	0.5	1.67E-07	0.01	1.67E-05	8.00E-03	2.08E-05
dust_MT_5_typ	MT	5	9.44E-08	0.01	9.44E-06	8.00E-03	1.18E-05
dust_MT_50_typ	MT	50	1.13E-11	0.01	1.13E-09	8.00E-03	1.41E-09
dust_OR_0.5_typ	OR	0.5	9.54E-08	0.01	9.54E-06	8.00E-03	1.19E-05
dust_OR_5_typ	OR	5	3.64E-08	0.01	3.64E-06	8.00E-03	4.55E-06
dust_OR_50_typ	OR	50	1.28E-11	0.01	1.28E-09	8.00E-03	1.60E-09
dust_WY_0.5_typ	WY	0.5	1.89E-08	0.01	1.89E-06	8.00E-03	2.36E-06
dust_WY_5_typ	WY	5	1.30E-08	0.01	1.30E-06	8.00E-03	1.63E-06
dust_WY_50_typ	WY	50	3.20E-12	0.01	3.20E-10	8.00E-03	4.00E-10
MAXIMUM APPLICATION RATE							
dust_MT_0.5_max	MT	0.5	1.02E-06	0.01	1.02E-04	8.00E-03	1.28E-04
dust_MT_5_max	MT	5	5.78E-07	0.01	5.78E-05	8.00E-03	7.23E-05
dust_MT_50_max	MT	50	7.80E-11	0.01	7.80E-09	8.00E-03	9.75E-09
dust_OR_0.5_max	OR	0.5	5.85E-07	0.01	5.85E-05	8.00E-03	7.31E-05
dust_OR_5_max	OR	5	2.23E-07	0.01	2.23E-05	8.00E-03	2.79E-05
dust_OR_50_max	OR	50	7.85E-11	0.01	7.85E-09	8.00E-03	9.81E-09
dust_WY_0.5_max	WY	0.5	1.16E-07	0.01	1.16E-05	8.00E-03	1.44E-05
dust_WY_5_max	WY	5	7.97E-08	0.01	7.97E-06	8.00E-03	9.96E-06
dust_WY_50_max	WY	50	1.96E-11	0.01	1.96E-09	8.00E-03	2.45E-09

¹Toxicity Reference Value (TRV) - TRVs relate the dose of a compound with a potentially adverse effect. TRVs were selected during a review of the ecotoxicological literature.

²Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-21
Potential Risks to Aquatic Species from Accidental Spill to Pond (Acute Exposure)

Parameters/Assumptions		Value	Units
Volume of pond (V_p)		1,011,715	L
Volume of spill (V_{spill})	Truck (V _{spill_t})	757	L
	Helicopter(V _{spill_h})	529.9	L
Herbicide concentration in mixture (C_m)¹	Truck (C _{m_t})	910.78	mg/L
	Helicopter (C _{m_h})	4,553.90	mg/L
Risk Quotients²			
Scenario	Concentrations in water (C _w): (C _m × V _{spill}) / V _p	Units	Fish Aquatic Invertebrates Non-Target Aquatic Plants
Truck spill into pond	0.68	mg/L	6.81E-03 6.81E-03 1.61E+02
Helicopter spill into pond	2.39	mg/L	2.39E-02 2.39E-02 5.64E+02

¹Based on herbicide mixed for the maximum application rate, where truck spray rate is 25 gallons per acre and helicopter spray rate is 5 gallons per acre. C_m = [application rate x (1/spray rate)] converted from lb/gallon to mg/L.

²Risk Quotient = Estimated Dose/Toxicity Reference Value.

TABLE B-22

**Potential Risks to Aquatic Species from Accidental Direct Spray of Pond and Stream
(Acute and Chronic Exposure)**

Parameters/Assumptions	Application Rate	Value	Units
Pond			
Application rates (R)	Typical	0.031	lb/acre
	Maximum	0.19	lb/acre
Area of pond (Area)		0.25	acre
Volume of pond (Vol)		1,011,715	L
Mass sprayed on pond (R x Area)	Typical	3,515.338	mg
	Maximum	21,545.62	mg
Concentration in pond water (Mass/Vol)	Typical	0.003475	mg/L
	Maximum	0.02130	mg/L
Stream			
Width of stream		2	m
Length of stream impacted by direct spray		636.15	m
Area of stream impacted by spray (Area)		1272.3	m ²
Depth of stream		0.2	m
Instantaneous volume of stream impacted by direct spray (Vol)		254,460	L
Mass sprayed on stream (R x Area)	Typical	0.00975	lb
	Maximum	0.05974	lb
Mass sprayed on stream - converted to mg	Typical	4,420.819	mg
	Maximum	27,095.341	mg
Concentration in stream water (Mass/Vol)	Typical	0.01737	mg/L
	Maximum	0.1065	mg/L

TABLE B-22 (Cont.)

Potential Risks to Aquatic Species from Accidental Direct Spray of Pond and Stream (Acute and Chronic Exposure)

Scenario	Application Rate	Concentration in water (mg/L)	Fish	Risk Quotients ¹	
				Aquatic Invertebrates	Non-Target Aquatic Plants
Acute					
Direct spray to pond	Typical	3.47E-03	3.47E-05	3.47E-05	8.21E-01
	Maximum	2.13E-02	2.13E-04	2.13E-04	5.03E+00
Direct spray to stream	Typical	1.74E-02	1.74E-04	1.74E-04	4.11E+00
	Maximum	1.06E-01	1.06E-03	1.06E-03	2.52E+01
Chronic					
Direct spray to pond	Typical	3.47E-03	1.05E-04	3.62E-05	1.34E+00
	Maximum	2.13E-02	6.45E-04	2.22E-04	8.19E+00
Direct spray to stream	Typical	1.74E-02	5.26E-04	1.81E-04	6.68E+00
	Maximum	1.06E-01	3.23E-03	1.11E-03	4.10E+01

¹Risk Quotient = Estimated Dose/Toxicity Reference Value.

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